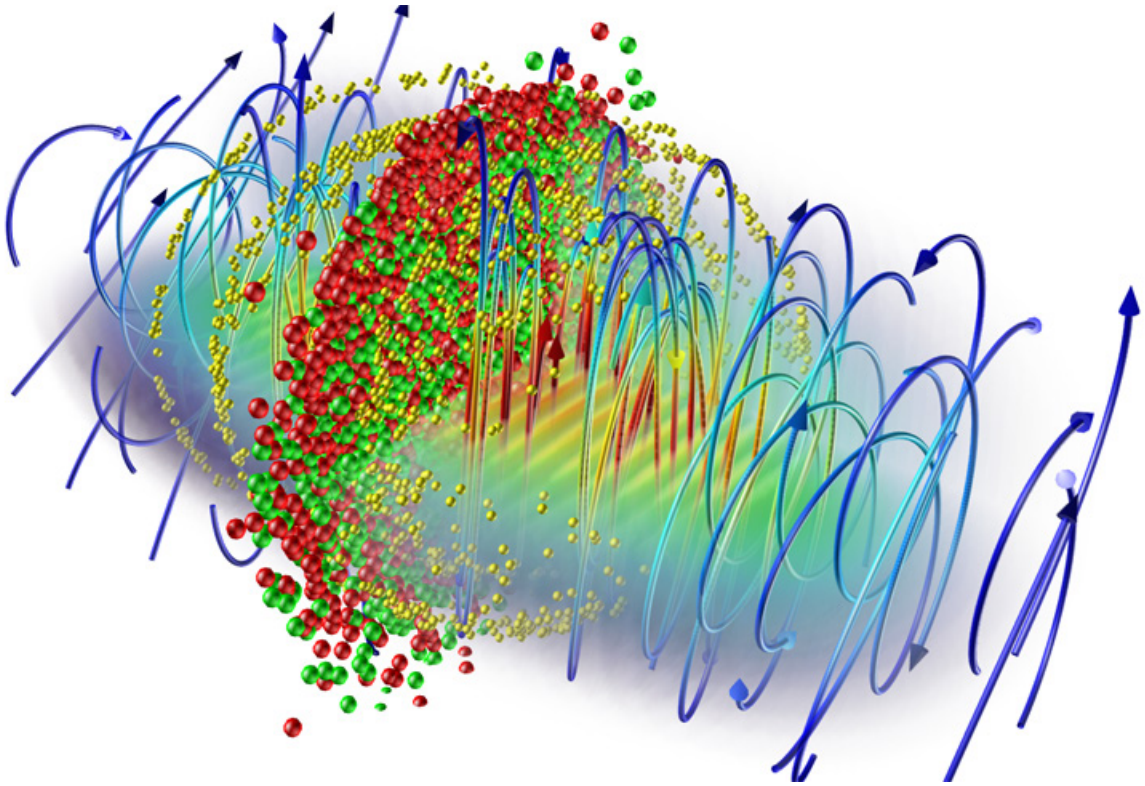
Department of Physics

Annual Report 2015



TÉCNICO LISBOA

Department of Physics

Annual Report 2015

TÉCNICO LISBOA

Cover image: Thomas Grismayer/GoLP – Group for Lasers and Plasmas/IPFN

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Message from the President

The Department of Physics (DF) of Instituto Superior Técnico is a vibrant department that aspires to understand and change the world in which we live and work. It was created in 1978, from what was at the time the Secção de Física (Physics Section), a section that traditionally assured a very solid knowledge of basic sciences, crucial to the IST engineering courses, following a model inspired by the German Technische Hochschulen schools. Nowadays, the DF is responsible for providing a rigorous basic science background in physics to more than 2000 engineering and architecture students per year.

In the 80's, the DF reinforced its teaching activities by creating very successful undergraduate and post-graduate degrees in Engineering Physics and in Physics, and intensified the collaboration with major European scientific and technological research institutions, such as the European Organization for Nuclear Research (CERN), the Joint European Torus (JET) and the International Thermonuclear Experimental Reactor (ITER), the European Southern Observatory (ESO) and the European Space Agency (ESA). The DF asserted itself in the scientific national and international framework.

We offer a distinctive environment for research and physics studies at all levels. Our students learn through carefully designed study programmes delivered by physicists who are leaders in their fields. A combination of groundbreaking research and outstanding students leads to excellent student achievement and employment prospects.

We have scientists across the full spectrum, ranging from fundamental and theoretical research targeted on understanding the laws of the Universe to industrial challenges in applied and engineering physics. We conduct research in Astrophysics,

Image: Técnico Lisboa

Gravitation, Condensed Matter, Nanotechnology, Particle Physics, Nuclear Physics, Plasma Physics, Lasers, Nuclear Fusion and Interdisciplinary Physics in Energy, Dynamic Systems, Biomedical Engineering and Earth Sciences.

One of the most exciting aspects of our work is the interaction with the students. The DF attracts exceptional academic staff. Our reputation is one of the reasons why we have been able to attract the best students in the country. In 2015, the Integrated Master's Program in Engineering Physics (MEFT) ranked 5th among hundreds of degrees in the country. The interaction of these excellent students with the faculty in a broad range of activities that take place in the department is important to science, technology and society.

The DF coordinates several M.Sc. and PhD degrees on Physics and on Engineering Physics, naturally integrating research and teaching activities. We have more than 350 students in the MEFT and circa 50 PhD students in the Physics PhD programme and another 50 in the Engineering Physics PhD programme. Our doctoral programmes are also anchors for several international and FCT (Fundação para a Ciência e Tecnologia) Doctoral Programmes: International Doctorate in Fusion Science and Engineering Erasmus Mundus Fusion-DC, Advanced Program in Plasma Science and Engineering (APPLAuSE), Doctoral Programme in the Physics and Mathematics of Information: Foundations of Future Information Technologies (DP-PMI), International Doctorate Network in Particle Physics, Astrophysics and Cosmology (IDPASC) and Advanced Integrated Microsystems (AIM).

In addition, through a variety of research centers - Center for Nuclear Sciences and Technologies (C2TN), Center of Physics and Engineering of Advanced Materials (CeFEMA), Center for Theoretical Particle Physics (CFTP), Multidisciplinary Center for Astrophysics (CENTRA), Center for Natural Resources and Environment (CERENA), INESC - Microsystems and Nanotechnologies (INESC-MN), Institute for Plasmas and Nuclear Fusion (IPFN) and Laboratory of Instrumentation and Experimental Particle Physics (LIP) - our faculty members are engaged in collaborative efforts with national and international research centers and universities and with industry to address a wide range of research issues in science and technology.

We strive to be at the forefront of research, to educate our students with accurate fundamental knowledge and simultaneously to engage students with emerging technologies and their applications. Recent years were not easy for Portugal and were particularly hard for universities and for the DF. Regardless, the DF kept its leading position (and even increased it) by hiring new professors, thus ensuring faculty renewal, wining competitive external research funding (hosting several European Research Council - ERC grants), restructuring the curricula of our degrees and tuning the contents of the courses, attracting more and even better students.

The DF is aware of the importance of public outreach initiatives. In 2015, we created a promotional video for the MEFT - Master's degree in Engineering physics. Many outreach activities are traditionally organized in collaboration with the research units and NFIST- Physics Students at the IST. In 2015, such activities had a major impact

in thousands of secondary school students and their teachers.

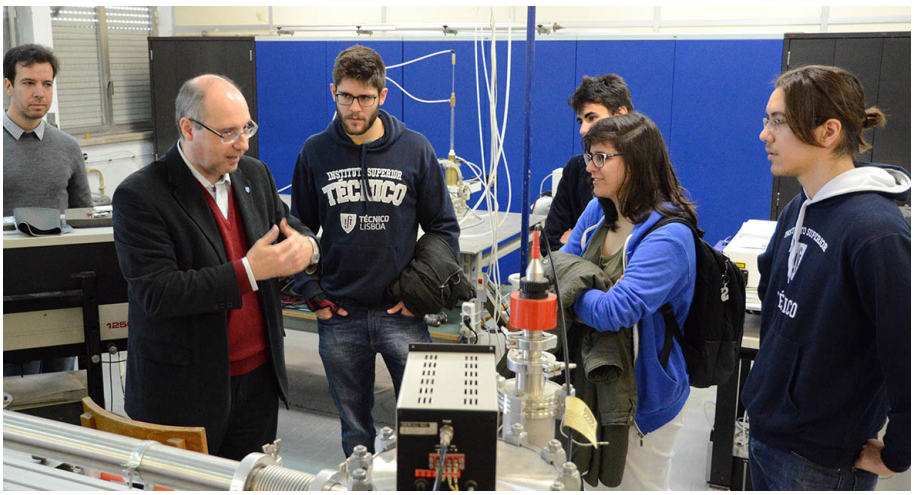
The support of the Alumni has been crucial. Such relations have been the starting point of new challenges, and sharing experiences with our Alumni gives us an extremely valuable feedback about our work and our plans. The DF aims to increase and foster the participation of the Alumni in its activities and to discuss new collaborations.

The exploration of new directions and new ideas anchored on creative thinking makes the DF unique. And as always, we are led by an insatiable curiosity, a fascination with the unknown and the drive to discover and create something new!

Welcome to the Physics Department.

Professor Pedro Brogueira
President of the Physics Department

Departmental Activities



The Department of Physics has been responsible for the following activities:

Coordination activities

Coordination of the MEFT-Integrated Masters degree in Engineering Physics
Coordination of the Doctoral Program in Physics
Coordination of the Doctoral Program in Engineering Physics

Coordination of the curricular units in various topics in advanced or fundamental physics (Mechanics and waves, Electromagnetism and Optics, Thermodynamics and the structure of matter, Physics for the Integrated Master degree in Architecture), taught to more than 2000 students of various Engineering Degrees each semester in Alameda and Taguspark IST Campi.

Participation, together with other IST departments, in the Coordination of the MEGE - Master in Energy Engineering and Management, being member of the Scientific Committee.

Participation in the Scientific Committee of the Master degree in Biomedical Engineering.

Definition of the new curricula and curricular plans for the Integrated Master's degree in Engineering Physics.

Definition of the new curricula and curricular plans for the PhD degree in Engineering Physics.

Image: IFPN

Definition of the new curricula and curricular plans for the PhD degree in Physics.

Preparation of the documents for the evaluation of the MEFT, PhD in Physics and PhD in Engineering Physics by the A3ES - National Agency for the Evaluation and Accreditation in Higher Education

Improvement of the quality control system in teaching activities under the Department of Physics responsibility in Alameda and Taguspark IST Campi. Work done in cooperation with the Coordination of MEFT, the PhD programs in Physics and Engineering Physics and the Pedagogical Council of the IST.

Development and implementation of new methodologies and platforms (MOOC's, QUIZ's) as support for teaching activities both at Alameda and Taguspark IST Campi.

Infrastructures

Improvement the department laboratory facilities: in 2015 the priority was given to the LabDemo - Demonstrations Laboratory, Laboratory for Fundamental Physics, Oscillations and Waves Laboratory, Electromagnetism and Thermodynamics Laboratory, and the DF Laboratories at Taguspark.

The multimedia laboratory for production of videos and MOOC's by the Department of Physics was created.

International Relations

Establishment of new ERASMUS protocols as an important step to attract more Portuguese and international students for the Masters in Engineering Physics and PhD programs.

Establishment and development of new collaborations and protocols with various Institutions, national and international, for technological and scientific cooperation and exchange of students. Detailed information is given in the sites of the Scientific Areas.

Image and Communication

Improvement of the Communication and image of the Department of Physics and the MEFT.

Publication of the promotional video for the MEFT - Masters in Engineering physics.

Organization of the Colloquia at the Department of Physics on a regular basis.

Organization of the “Welcome Workshop (Challenging the limits in Science and Technology for the prospective MEFT Students)”, June 2015.

Organization of the “Welcome Meeting” with the new students in September 2015.

Mantaining the website of the Department with updated information.

Strengthening the cooperation with the research units associated with the Department of Physics.

Publication of press releases in coordination with scientific research units and the GCRP-Gabinete de Comunicação e Relações Públicas.

Foster and support the contact with media and participation in debates, TV, newspapers, radio interviews.

Publication, with support from the NME - Núcleo Multimedia and e-learning, of various promotional videos about scientific activities held at the Department of Physics and videos with comments about scientific highlights (ex: Nobel prize 2015), ISTtv in YouTube.

Publication, in Projeto MEFT YouTube, of videos by students about the topics of their MSc dissertations.

Organization or participation in various outreach activities. These activities are listed separately. In 2015, a special attention was devoted to promote the International Year of Light.

Strengthening the cooperation with the Portuguese Physics Society and the Portuguese Astronomical Society.

NFIST

Strengthening the cooperation with the NFIST - Association of Physics Students at IST. A special attention is devoted to support the “Physics Week”, a week of activities held at IST for school students and other initiatives.

Organization & Responsibilities in the Department of Physics

President of the Department
Prof. Pedro Brogueira

Executive Commission
Vice-President for general affairs:
Prof. Jorge Romão

Vice-President for teaching activities,
space and human resources:
Prof. Luís Viseu Melo

Vice-President for communication and promotion
of education and science:
Prof. Ana Mourão

Vice-President for new technology platforms
in teaching and research:
Prof. Horácio Fernandes

Department of Physics Representative in Taguspark
Prof. António Ferraz

Coordinators of Scientific Areas
Astrophysics and Gravitation: Prof. José Pizarro de Sande e Lemos
Condensed Matter and Nanotechnology: Prof. Pedro Brogueira
Interdisciplinary Physics: Prof. Rui Manuel Agostinho Dilão
Particle and Nuclear Physics: Prof. Jorge Crispim Romão
Plasma Physics, Lasers and Nuclear Fusion: Prof. Luís Oliveira e Silva

Course Coordinators
Master in Physics Engineering Coordinator: Prof. Teresa Peña
Vice Coordinator: Prof. Vasco Guerra
Doctoral Program in Physics Coordinator: Prof. Vitor Rocha Vieira
Doctoral Programme in Engineering Physics Coordinator: Prof. Vitor Rocha Vieira

Responsible for Tutoring Program: Prof. Teresa Peña
Mobility Coordinator: Prof. Teresa Peña

Strategic Comission
José Pizarro de Sande e Lemos, Luís Paulo da Mota Capitão Lemos Alves, Mário João Martins Pimenta, Pedro Miguel Félix Brogueira, Vítor João Rocha Vieira, Ana Maria Vergueiro Monteiro Cidade Mourão, Horácio João Matos Fernandes, Maria Teresa Haderer de la Peña Stadler, Luís Filipe Moreira Mendes.

A Review of the Department of Physics in 2015

54
Full-time faculty

11
Administrative staff

365
Students enrolled in the Masters program, of which 80% are male and 20% are female.

101
Students enrolled in the Doctorate programs, of which 75% are male and 25% are female.

5
Scientific areas of expertise

8
Leading research units

246
Scientific publications

5
Books

6
Awards for scientific achievements

14
Teaching labs

2
High performance computing clusters

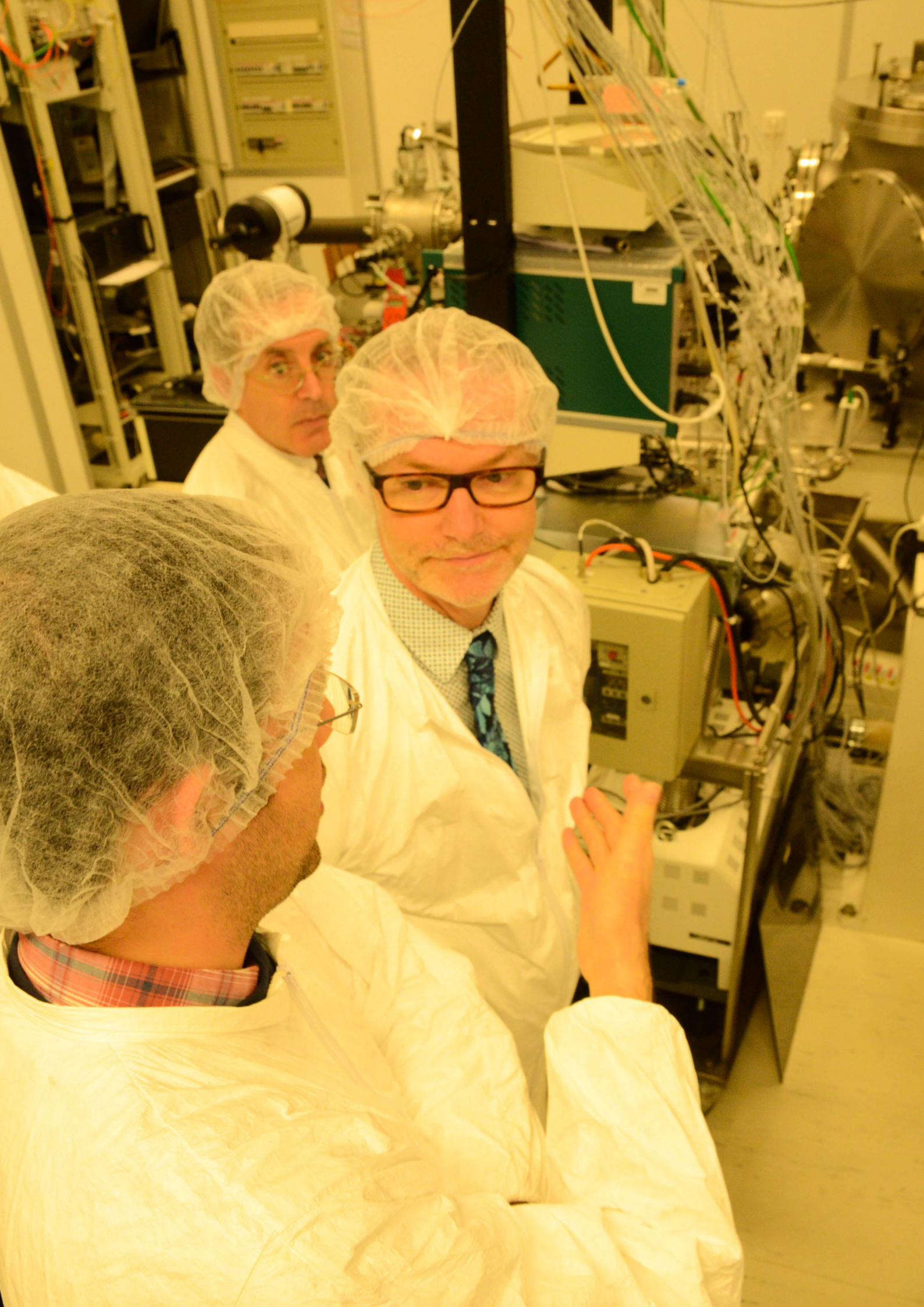
99
Seminars and public lectures

20
Colloquia at the DF

21
Conferences and workshops

70+
Outreach activities

14
International masterclasses



Part 1 / Education

Engineering Physics: At the Frontiers and Even Beyond

The Master's Program in Engineering Physics at Técnico is a 5 year degree that combines uniquely Physics, Engineering and Advanced Technologies into a single and coherent training.

Talent that comes in

Every year, 60 new students enroll into the program for the first time. They belong to the group with the top 10% results in the national exams, in the universe of all the students that take the same exams.

Talent that goes out

The success rate in obtaining the degree in 5 years is 94%. The employement rate officially reported in December of 2015 and that refers to graduates in the period 2011-2015 is 98,5%.

The Engineering Physics program is designed to generate innovators, out-of-the-box thinkers who are able to address challenges in the knowledge frontier determining investments crucial to the society, in domains where Physics and Engineering are linked together. The graduates work in areas such as energy, environment, health systems and biomedicine, financial services and research, organization and visualization of information, communications, interconnectivity and computation.

Original Image: NASA

The scientific value

In its already 30 year tradition of quality, constant update, and internationalization, the Engineering Physics Master's program gives graduates an in depth foundation on science, mathematics and engineering concepts, while promoting critical reasoning and independent thinking.

The societal value

The training has a threefold mission:

To create human capital with the capacity to recognize, innovate and solve problems critical to society.

To renew generations of scientists and university faculty staff in areas of international scientific interest and investment, as Particle and Nuclear Physics, Physics of Matter under extreme conditions, Lasers, Advanced Materials, Space Science and Astrophysics.

To train generations of entrepreneurs for leadership that adapt well to the acceleration of the scientific and technological development, as well as of consultants/auditors of projects or risk situations.

The dream

The training materializes the vision that material, economical, human and social progress can be achieved by the understanding and the manipulation of matter --- not only at the macroscopic and human scale, as in the scientific and industrial revolutions of the XVII, XVIII and XIX centuries, but also at the scale of the atomic nucleus and electrons in the atoms and molecules, reached by the Quantum Mechanics revolution of the XX century, and certainly, in the XXI century, also at the large scale of the distant and unknown parts of the Universe.

Teresa Peña, MEFT Coordinator, July 2016

The MEFT Curriculum

The MEFT training is sustained on scientific research units carrying out in the following areas: Astrophysics and Gravitation, Plasma Physics, Nuclear Fusion and Lasers, Nuclear and Particle Physics, Condensed Matter Physics and Nanotechnology, Interdisciplinary Physics (Energy, Physics of the Earth, Dynamical Systems, Biomedical Applications).

MEFT Training: 1st Cycle

1st Year	
1st Semester	**2nd Semester**
Mechanics and Waves	General Mechanics
Programming	Chemistry
Linear Algebra	Differential & Integral Calculus II
Differential & Integral Calculus I	Digital Systems
Laboratory of Basic Physics	Workshop Laboratory

2nd Year	
1st Semester	**2nd Semester**
Computational Mechanics	Analytical Mechanics
Complex Analysis and Differential Analysis	Probabilities and Statistics
Laboratory of Oscillations and Waves	Theory of Circuits & Fundamental of Electronics
Thermodynamics and Structure of Matter	Laboratory of Complements of Electro-magnetism and Thermodynamics
Option A: Computational Physics/ Microprocessors	Electromagnetism and Optics

3rd Year	
1st Semester	**2nd Semester**
Mathematical Techniques in Physics	Laboratory for Innovation and Development
Quantum Mechanics I	Management
Laboratory of Atomic Physics	Laboratory of Advanced Physics
Optics and Radiation Physics	Statistical Physics
Classical Electrodynamics	Solid State Physics
Option B: Physics of Continuum Medium Systems/General Electronics	Option C: Quantum Mechanics II/Electronic Instrumentation

MEFT Training: 2nd Cycle

4th Year	
1st Semester	**2nd Semester**
2 Curricular Units from core training	2 Curricular Units from core training
2 Curricular Units - Engineering track 3 Curricular Units Physics track	1 Curricular Unit - Engineering track/ 1 Curricular Units - Physics track
Engineering: 1 track option/ Physics: 0 option	2 Curricular Units from track options

5th Year	
1st Semester	**2nd Semester**
Introduction to Research	Dissertation
MEFT Project	
Free Option	
2 Curricular Units from track options	

Core Training
Management in Science and Tecnhnology, Quantum Optics and Lasers, Plasma Physics, Particle Physics

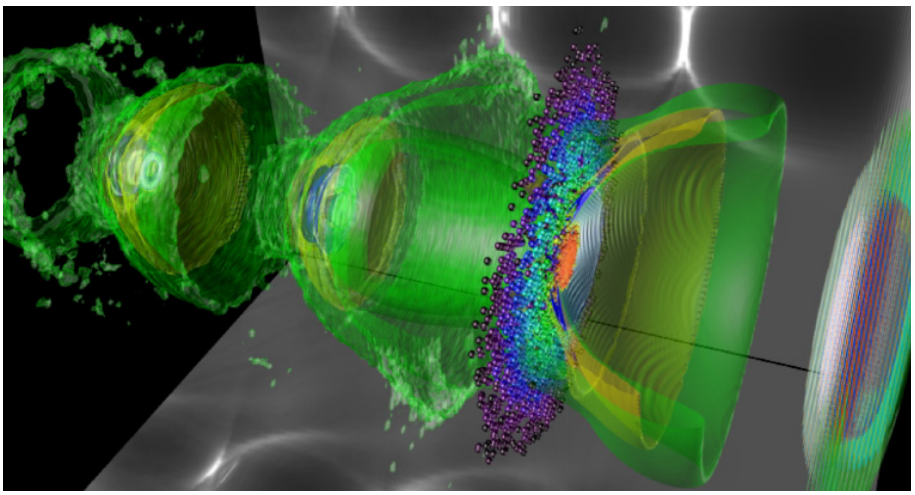
Engineering Track
Data Acquisition Systems, Nanotechnology and Nanoelectronics, Energy Technology

Physics Track
Condensed Matter Physics, Nuclear Physics, Relativity and Cosmology, Complements of Quantum Mechanics

Coordinadion
Prof. Teresa Peña (Coordinator) and Prof. Vasco Guerra (Vice-Coordinator)

Website
https://fenix.tecnico.ulisboa.pt/cursos/meft

PhD in Physics



Coordinator: Prof. Vítor Rocha Vieira.

Scientific Commitee: Prof. Vítor Rocha Vieira, Prof. José Sande Lemos, Prof. Luís Lemos Alves, Prof. Jorge Romão, Prof. Gustavo Castelo Branco.

Objectives: The PhD Program in Physics is designed to provide advanced knowledge and research capabilities in at least one of the scientific areas in which the Physics Department is organized. It basically aims at preparing researchers for autonomous research and development activities in the broad domain of Physics in order to become research scholars in an academic or industrial environment.

Organization: In the first year the PhD candidates follow a plan of studies with 4 advanced courses. After the first year all activity is devoted to research in preparation of the PhD thesis under the scientific supervision of a faculty member. The duration of the PhD is typically 3.5 to 4 years.

Scientific Areas: Particle and Nuclear Physics, Plasma Physics, Lasers and Nuclear Fusion, Condensed Matter Physics and Nanotechnology, Astrophysics and Gravitation, other areas of Physics.

Associated Research Centers: Centro de Física Teórica de Partículas (CFTP), Laboratório de Instrumentação e Física Experimental de Partículas (LIP), Instituto de Plasmas e Fusão Nuclear (IPFN), Centro de Física e Engenharia de Materiais Avançados (CeFEMA), Instituto de Engenharia de Sistemas e Computadores - Microsistemas e Nanotecnologias (INESC-MN), Centro Multidisciplinar de Astrofísica (CENTRA) and Centro de Ciências e Tecnologias Nucleares (C2TN).

Image: R. A. Fonseca/GoLP – Group for Lasers and Plasmas/IPFN

FCT PhD Programs Supported by the PhD in Physics: Advanced Program in Plasma Science and Engineering (APPLAuSE), Doctoral Programme in Physics and Mathematics of Information (DP - PMI): Foundations of Future Information Technologies, and Doctoral Programme in Particle Physics, Astrophysics and Cosmology (IDPASC - Portugal). These programmes have their own PhD fellowships.

Number of Registered Students: 46.

Employment: The PhD program in Physics form highly qualified researchers to work in national and international scientific centers, research laboratories, in the industry or in public or private service. Our graduates will be able to work in the great European institutions of research and technological development: European Organization for Nuclear Research (CERN); European Southern Observatory (ESO); European Space Agency (ESA); Joint European Torus (JET); International Thermonuclear Experimental Reactor (ITER). The PhD graduates in Physics can also follow an academic career as professors at universities or at any other school of higher education.

Collaborations with foreign institutions: Universidad Valencia (Spain), Consejo Superior de Investigaciones Científicas - CSIC, Madrid (Spain), Saclay Nuclear Research Centre - CEA (France), Université de Paris (France), École Polytechnique Fédérale de Lausanne - EPFL (Switzerland), Univeristy Tokyo (Japan), Imperial College (UK), Oxford University (UK), Cambridge University (UK), Massachusetts Institute of Technology - MIT (USA), Princeton University (USA), University of California, Los Angeles - UCLA (USA).

PhD in Engineering Physics

Coordinator: Prof. Vítor Rocha Vieira.

Scientific Commitee: Prof. Vítor Rocha Vieira, Prof. José Sande Lemos, Prof. Luís Lemos Alves, Prof. Pedro Brogueira, Prof. Mário Pimenta.

Objectives: The PhD Program in Engineering Physics is designed to provide advanced knowledge and research capabilities into subjects involving physical engineering applications, such as advanced experimental techniques of plasmas physics, intense lasers, optics, nanotechnologies and nuclear and particle physics. Emphasis is also given to data acquisition systems, real time control measurements, instrumentation for plasmas and nuclear physics, and micro and nano-fabrication techniques.

Organization: In the first year the PhD candidates follow a plan of studies with 4 advanced courses. After the first year all activity is devoted to research in preparation of the PhD thesis under the scientific supervision of a faculty member. The duration of the PhD is typically 3.5 to 4 years.

Scientific Areas: Plasma Physics, Lasers and Nuclear Fusion, Particle and Nuclear Physics, Condensed Matter Physics and Nanotechnology, Biomaterials and Biological Sciences, and other areas of Physics.

Associated Research Centers: Instituto de Plasmas e Fusão Nuclear (IPFN), Laboratório de Instrumentação e Física Experimental de Partículas (LIP), Centro de Física Teórica de Partículas (CFTP), Centro de Física e Engenharia de Materiais Avançados (CeFEMA), Instituto de Engenharia de Sistemas e Computadores – Microsistemas e Nanotecnologias (INESC-MN), and Centro de Ciências e Tecnologias Nucleares (C2TN).

Image: INESC-MN

FCT PhD Programs supported by the PhD in Engineering Physics: Advanced Program in Plasma Science and Engineering (APPLAuSE), Doctoral Programme in the Physics and Mathematics of Information (DP-PMI): Foundations of Future Information Technologies, Doctoral Programme in Particle Physics, Astrophysics and Cosmology (IDPASC-Portugal), and Doctoral Programme in Advanced Integrated Microsystems (AIM). These programmes have their own PhD fellowships.

Number of Registered Students: 55.

Employment: The PhD program in Engineering Physics form highly qualified researchers to work in national and international Research & Development offices of industrial enterprises such as EDP Renovaveis (Portugal), LusoSpace (Portugal), Lertech (China), Picosense (USA), Nordiko (UK), AIXTRON AG (Germany) and Fusion for Energy F4E (Spain). Our graduates will also be able to work in the great European institutions of research and technological development: European Organization for Nuclear Research (CERN); European Southern Observatory (ESO); European Space Agency (ESA); Joint European Torus (JET); International Thermonuclear Experimental Reactor (ITER).

Collaborations with foreign institutions: Universidad Valencia (Spain), Consejo Superior de Investigaciones Científicas - CSIC, Madrid (Spain), Saclay Nuclear Research Centre - CEA (France), Université de Paris (France), École Polytechnique Fédérale de Lausanne - EPFL (Switzerland), Univeristy Tokyo (Japan), Imperial College (UK), Oxford University (UK),Cambridge University (UK), Massachusetts Institute of Technology - MIT (USA), Princeton University (USA), University of California, Los Angeles - UCLA (USA).

Doctoral Theses

Student Name: Eduardo Paulo Jorge da Costa Alves
Title: Microphysical Plasma Processes: In Silico Studies and a Route to the Required Laser Intensities for Laboratory Exploration
Supervisor: Luís Miguel de Oliveira e Silva

Student Name: Hugo Filipe de Almeida Pires
Title: Intense Ultra-short Laser Pulse Generation
Supervisor: Gonçalo Nuno Marmelo Foito Figueira
Co-supervisor: Cristina Hernandez Gomez

Student Name: João Maria Melo Albuquerque Saraiva Mouro
Title: Dynamics of Thin-Film Silicon Flexural Mems: From Material Properties to Electrical Characterization
Supervisor: João Pedro Estrela Rodrigues Conde
Co-supervisor: Virginia Chu

Student Name: João Pedro Canhoto Espadanal
Title: Study of the Longitudinal and Transverse Cosmic Ray Shower Profiles at the Pierre Auger Observatory
Supervisor: Mário João Martins Pimenta

Student Name: José de Almeida Vicente
Title: Plasma Filament Studies Using Microwave Reflectometry on the ASDEX Upgrade Tokamak
Supervisor: Maria Emília Morais da Fonseca e Silva da Costa Manso
Co-supervisors: Carlos Alberto Nogueira Garcia Silva and Garrard Conway

Student Name: Leonardo Antunes Pedro
Title: Scalar Fields in Particle Physics
Supervisor: Gustavo da Fonseca Castelo Branco

Student Name: Marija Vranic
Title: Extreme Laser-matter Interactions: Multi-scale PIC Modelling from the Classical to the QED Perspective
Supervisor: Luís Miguel de Oliveira e Silva

Master's Theses

Student Name: Alexandre Onofre dos Santos Sardinha Gomes
Title: Control of The Sawtooth Instability in Fusion Plasmas with Dominant Fast Particles
Supervisor: Bruno Miguel Soares Gonçalves
Co-supervisor: Marco de Baar

Student Name: André Filipe Mocho Costa Lopes
Title: Radiation Tension in Nonlinear Plasma Metamaterials
Supervisor: Eduardo Paulo Jorge da Costa Alves
Co-supervisor: Luís Miguel de Oliveira e Silva

Student Name: André Madeira Bastos da Cunha
Title: Study of Photons Orbital Angular Momentum for Optical Communications
Supervisor: Gonçalo Nuno Marmelo Foito Figueira
Co-supervisor: Paulo Sérgio de Brito André

Student Name: André Miguel Alves Farinha
Title: Robust and Self-Adaptable 5-Finger 4-DoA Robotic Hand
Supervisor: Pedro Manuel Urbano de Almeida Lima
Co-supervisor: Umesh Vinaica Mardolcar

Student Name: André Miguel Baptista Boné
Title: Shadowgraphy Based Diagnostics for Laser-Plasma Interactions
Supervisor: João Alberto dos Santos Mendanha Dias

Student Name: Fábio Alexandre Lopes Cruz
Title: Collisionless Shocks in Mini Magnetospheres in the Laboratory and in Astrophysics
Supervisor: Eduardo Paulo Jorge da Costa Alves
Co-supervisor: Luís Miguel de Oliveira e Silva

Student Name: Filipe da Conceição Pereira Monteiro
Title: General and Specific Results for d Dimensional Orbits in General Relativity: From a Four Dimensional Space-Time to the Large D Limit
Supervisor: José Pizarro de Sande e Lemos

Student Name: Francisco Maria Lampreia Burnay
Title: Tomografia no tokamak ISTTOK
Supervisor: Horácio João Matos Fernandes

Student Name: Gabriel António Nunes Farinha
Title: Compact Size 3D Magnetometer Based on Magnetoresistive Sensors
Supervisor: Susana Isabel Pinheiro Cardoso de Freitas

Student Name: Helena Contreira Marques
Title: Influence of SPECT Reconstruction Algorithms in the Improvement of Snr in Cardiac Imaging
Supervisor: Lídia Ferreira
Co-supervisor: Guilhermina Cantinho

Student Name: Inês Filipa Completo Guerreiro
Title: Modeling the Non-linear Dynamics of Calcium in Chromaffin Cells
Supervisor: Maria Teresa Pinheiro
Co-supervisor: David Gall

Student Name: Joana Cristina de Matos Raimundo Duarte
Title: Coherent XUV Imaging
Supervisor: Marta Leitão Mota Fajardo

Student Name: Joana Margarida Vieira Batista
Title: Estudo do Comportamento Térmico de Habitações Sazonais Climatizadas
Supervisor: Luís Filipe Moreira Mendes
Co-supervisor: Pedro Miguel Félix Brogueira

Student Name: João Duarte Cardoso Texugo de Sousa
Title: Discrete Symmetries and Proton Decay in the Adjoint SU(5) Model
Supervisor: David Emmanuel da Costa

Student Name: João Eduardo Henriques Braz
Title: Electronic Properties of Single-layered Transition Metal Dichalcogenides
Supervisor: Eduardo Filipe Vieira de Castro
Co-supervisor: Nuno Miguel Reis Peres

Student Name: João Francisco da Cruz Vargas
Title: Improvement of State-Resolved Kinetic Models Applied to N2-CH4 hypersonic entry flows
Supervisor: Jorge Manuel Amaro Henriques Loureiro
Co-supervisor: Mário António Prazeres Lino da Silva

Student Name: João Luís de Figueiredo Rosa
Title: Superradiant Amplification by Stars and Black Holes
Supervisor: Vítor Manuel dos Santos Cardoso

Student Name: João Maria Abreu Condesso
Title: Electricity Market Simulator for Management of Virtual Power Plants
Supervisor: Carlos Augusto Santos Silva

Student Name: João Pedro Martins Godinho
Title: Carrier Transport and Energy Harvesting in ZnO Nanowires
Supervisor: Reinhard Horst Schwarz
Co-supervisor: Rachid Ayouchi

Student Name: João Tiago Serra Garcia Branco
Title: Nanoplasmonics at High Laser Intensities
Supervisor: Marta Leitão Mota Fajardo
Co-supervisor: Hamed Merdji

Student Name: Luis Manuel Cerdeira Gil
Title: Investigation of the Effect Of Divertor Geometry on the L-H Transition Using Reflectometry Diagnostics
Supervisor: Carlos Alberto Nogueira Garcia Silva

Student Name: Maria João Dias Carrilho
Title: Carbon Footprint of Instituto Superior Técnico - Campus Alameda
Supervisor: Carlos Augusto Santos Silva
Co-supervisor: João Filipe Dias Rodrigues

Student Name: Miguel Assis Gordinho
Title: Caracterização do Potencial de Eficiência Energética em Edíficios Residenciais
Supervisor: Carlos Augusto Santos Silva
Co-supervisor: João Carlos Carvalho de Sá Seixas

Student Name: Miguel Gomes Lopes
Title: Desenvolvimento de um Sistema de Baixo Custo para a Previsão da Irradiância Solar a Curto Prazo
Supervisor: Carlos Augusto Santos Silva
Co-supervisor: Mário António da Silva Neves Ramalho

Student Name: Miguel Pacheco de Carvalho da Silva Batista
Title: Solar Power Storage Using Hydrogen: An e-lab Experiment
Supervisor: Horácio João Matos Fernandes
Co-supervisor: Rui Pedro da Costa Neto

Student Name: Nuno Filipe Rosa Agostinho
Title: Symmetries and Parametrizations of the Quark and Lepton Sectors
Supervisor: Joaquim Inácio da Silva Marcos

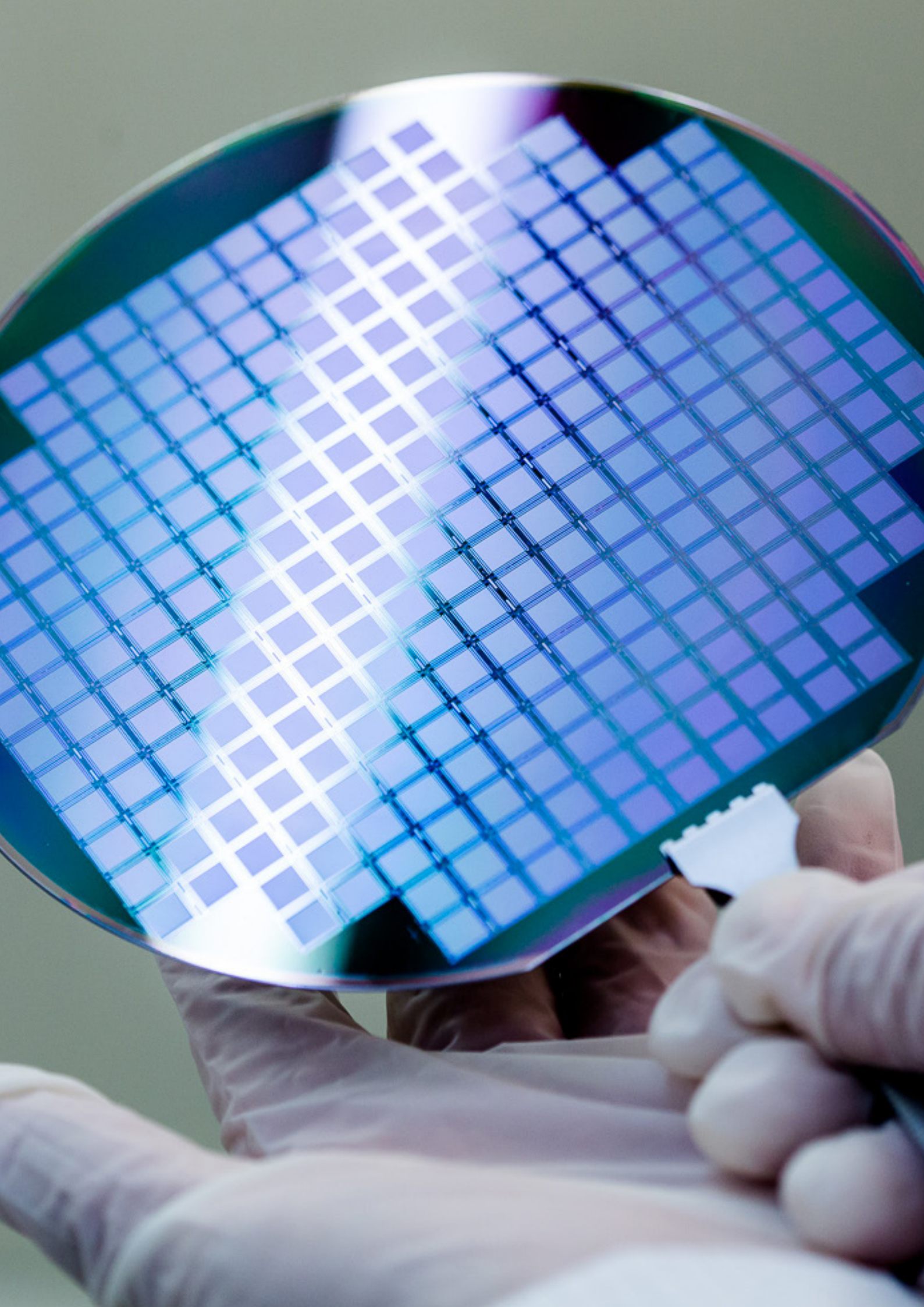
Student Name: Pedro Arsénio Nunes Aleixo Viegas
Title: Ionization in Atmospheric-pressure Helium Plasma Jets
Supervisor: Vasco António Dinis Leitão Guerra
Co-supervisor: Luís Paulo da Mota Capitão Lemos Alves

Student Name: Pedro Francisco de Deus Lourenço
Title: Automatic Sub-microwave Measurements on a Beam-Plasma Experiment
Supervisor: Horácio João Matos Fernandes

Student Name: Pedro Luís de Oliveira Rosado Freire da Silva
Title: A DNP-NMR Setup for Sub-nanoliter Samples
Supervisor: Pedro José Oliveira Sebastião
Co-supervisor: Giovanni Boero

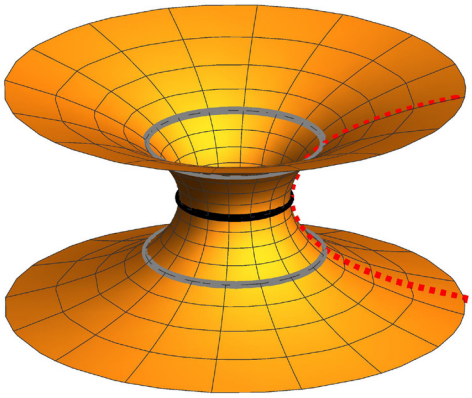
Student Name: Ricardo André Duarte Varela
Title: Optimization of MR Sensor Geometry Towards Picotesla Detection
Supervisor: Susana Isabel Pinheiro Cardoso de Freitas

Student Name: Ulrike Ellen Eilhauer
Title: Optimization of Integrated Renewable Energy System Supplied for Net Zero Energy Buildings
Supervisor: Carlos Augusto Santos Silva



Part 2 / Scientific Areas

Astrophysics and Gravitation



Astrophysics and Gravitation are active areas at the forefront of scientific research of this century. From the universe as a whole and cosmology, to galaxies, stars and black holes, major and exciting developments have been happening in recent times. Black holes and neutron stars are able to accelerate objects to far larger energies than terrestrial accelerators, while simultaneously serving as dark matter deposits. In addition, the violent collision and merger of these objects produces huge bursts of gravitational radiation, which carry detailed information about their progenitors. Gravitational waves were detected for the first time on September 14, 2015, when the two LIGO interferometers displayed a GW signal from a merging pair of black holes. This historical discovery marks the dawn of the era of gravitational wave astronomy, and the opening of a new window onto the hitherto invisible landscape of the Universe. Also, every grand challenge in astrophysics and cosmology, namely, dark matter, dark energy, inflation, and early universe, needs support and endeavor from the scientific community to be solved.

On the astrophysical and cosmological side, the formation of baryonic structures in our universe from the smallest to the largest objects - stars, stellar clusters, molecular clouds and H II regions, galaxies and galaxy clusters and superclusters, results from the action of gravity combined with other fundamental forces on baryons, dark matter and dark energy. Among the challenging astrophysics problems that our group aims to solve, to understand how stars form and evolve, is the contribution of fluid dynamics and magnetic fields to the evolution of the Sun and stars, the determination of how dark matter influences stellar evolution (stellar populations I and III) and how dark energy changes the evolution of the universe. Among the various international activities we are involved with are the CALIFA spectroscopy collaboration which maps the host

Image: Paolo Pani

galaxies of supernovae needed to measure the dark energy content of the Universe, the probing of the interior of stars through their oscillations signature using the current asteroseismic data from the satellite mission Kepler (ESA/NASA), and preparing for the forthcoming PLATO observatory mission (ESA, to be launched in 2025). In addition, one of the most crucial challenges in which our research group is currently working on is the enigma of dark matter: What is dark matter made off? By understanding how it interacts with baryonic matter and how it affects the evolution of stars throughout the HR diagram and using asteroseismology, we are able to put constraints on the properties of dark matter. Indeed, we have shown that the presence of dark matter particles inside stars modifies their internal structure and their spectra of oscillations.

Gravitation has many faces, going beyond astrophysics. Indeed, gravitation is tied up with fundamental physics as we need to understand the nature of quantum gravity. Thus, the comprehension of new physics is tied to the understanding of general relativity, black holes, and stars. Was Einstein right? Is gravity really described by Einstein equations? What is the nature of the graviton? Is the event horizon of a black hole exactly as we think it is? Do black holes have no hair? Are black holes deformable? What happens to dark matter once it falls into the Sun or into other stars? What is the nature of dark energy? These are some of the most fundamental questions in physics that one will be able to answer in the next few years.

The Astrophysics and Gravitation area is the right place to be for this. The researchers and professors in this area in IST belong to the largest and most active group in the country working in astrophysics and gravitation, recognized by the European Research Council as of outstanding quality. They work in theory, but also in nume- rical simulations or instruments for some of the largest experiments in the world.

Our students have had successful careers in some of the most famous institutes world-wide... Do you want to know more? Schedule a visit to our group, all it takes is an email!

Teaching Activities

MSc Curricular Units
Relativity And Cosmology
Astrophysics
Topics In General Relativity And Cosmology
Astrophysics Laboratory
Topics In Particle Physics, Astrophysics And Cosmology
Project Meft
Introduction To Research
Master Thesis

PhD Curricular Units
Advanced Topics in General Relativity, Astrophysics and Cosmology I
Advanced Topics in General Relativity, Astrophysics and Cosmology II

Members

José Sande Lemos, Full Professor (Area Coordinator)
Vitor Cardoso, Associate Professor with *Agregação*
Ilídio Lopes, Assistant Professor with *Agregação*
Ana Maria Mourão, Associate Professor
Amaro Rica da Silva, Assistant Professor

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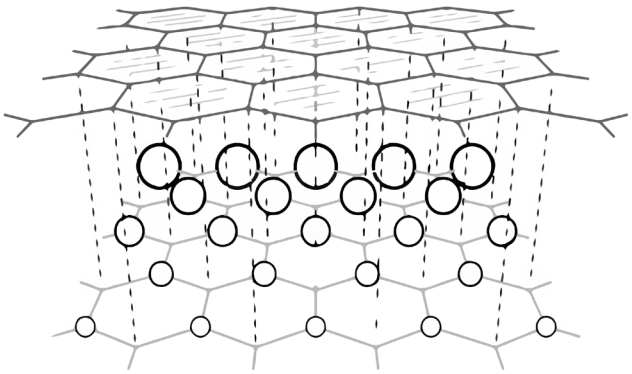
Condensed Matter and Nanotechnology



Condensed Matter Physics deals with the physical properties of condensed phases of matter. It concerns itself with properties of systems containing many interacting degrees of freedom: insulators and superconductors, liquids and solids, quantum spin chains, for example. The study of condensed matter physics involves measuring various material properties via experimental probes along with using techniques of theoretical physics to develop mathematical models that help in understanding physical behavior. At the nanometer scale, materials reveal new physical properties and opens the opportunity for new science, technology and applications. It is the field of Nanotechnology.

From hard condensed matter to soft matter and nanotechnology

Traditionally the area of condensed matter physics was concerned with the understanding of equilibrium phases of matter where concepts such as emergent phenomena, quasi-particles, symmetry breaking, phase transitions have gained increasing importance of the years. New states of matter have fueled the recent activity such as heavy-fermion systems, graphene and other two-dimensional systems, topological insulators, and have pushed the boundaries of our knowledge.

The understanding of equilibrium phases of matter is of cornerstone importance not only in hard condensed matter/solid state physics, but also in the understanding of soft matter like liquid crystals, polymers, dendrimers and ionic liquids where the very same ideas apply. More recently, the development of experimental techniques such as thin film deposition, scanning tunneling microscopy or atomic force microscopy

Original image: Niels Walet

allows to manipulate individual atoms allowing engineering of systems at a microscopic level where the laws of physics are dominated by quantum effects. The manipulation of matter at atomic or molecular levels in scales from 1 nm to typically 100 nm is the realm of nanotechnology. The development of experimental techniques designed to study nature at sub-atomic scales and the increased control of small systems at the nanoscale has allowed a significant improvement in our ability to fabricate, manipulate systems at the atomic level and to explore new technological applications at these length scales.

Many concepts relevant in the context of condensed matter physics share common features with other fields such as the quantum nature of real, macroscopic systems, field theory methods, criticality, scaling and the renormalization group, analogies to gravitational theories, to name a few. Also, the connection of condensed matter systems with cold atoms in optical lattices and other similarities with other systems, the interplay of quantum information and traditional condensed matter techniques have allowed significant progresses. Recently great effort has been put in systems far from equilibrium imposing new ideas on how complex systems behave.

Our activity in the Physics Department

Our activity on Soft Matter includes the research on complex fluids and partially ordered systems like liquid crystals, polymers, dendrimers and ionic liquids with application as smart information displays, optoelectronic devices, drug carriers in nanomedicine, "green" chemistry and CO2 capture systems for environment protection. In our labs we investigate experimentally the physical properties of such systems by means of nuclear magnetic resonance, x-ray diffraction, electro-optical measurements and atomic force microscopy.

The theoretical condensed matter physics research is related with low-dimensional systems and materials, spintronics, cold atoms, superconductivity and applications of quantum information in condensed matter systems. The search for new phases of matter and the complex properties of systems far from equilibrium are two of the main currents topics of research.

The electron-lattice coupling in graphene is very unusual and, when complemented with electron-electron interactions, is expected to lead to novel phases of matter. Consideration of the interplay between electron-electron and electron-lattice interactions in graphene and related systems is currently being studied. Also the study of possible intrinsic magnetism, superconductivity and topological phases in novel 2D materials (transition metal dechalcogenides, silicene) including topological superconductors. Hybrid heterostructures of graphene and novel 2D materials are also expected to have new functionalities with technological potential.

In our groups we study non-equilibrium phase transitions and route to thermalization in strongly interacting systems. In particular, we focus on the dynamics of transitions to topological phases.

In the field of Nanotechnology we combine the theoretical physics with state-of-the-art technologies to produce innovations at the nano scale. Our groups are motivated by the technological applications of the fundamental research. One example is the application of magnetoresistive sensors for safety and surface inspection, power electronics, biochips for health, magnetic scanners, among many others, through collaborative projects and contracts for service providing with the international industry.

We work in a clean room level 10, we have Atomic Force Microscopes, produce thin films with ion beam, sputtering and chemical vapor deposition systems, and define nanostructures by lithography. All of these are supported by advanced characterization lab infrastructures. Our students are integrated with the research groups early in their curricular years and gain experience in international teams. Several types of magnetic, semiconducting, insulating and conducting materials are deposited and characterized, to support the activities in micro-electronic devices and photovoltaic cells. In the area of spintronics, the groups have been studying fast spin dynamics in various configurations and using various methods to induce changes in spin orientation, in combination with the experimental validation in functional devices.

The preparation and characterization of low dimensional nanostructures, such as nanowires are also made. Our investigations envisage both the fundamental understanding of the physical properties and molecular organization of such materials and complex systems and the exploration of their potential for the development of applications with technological impact.

We combine the theoretical and experimental tools to build smart devices with novel functionalities. These are inspired by the state-of-the-art technologies, which require a multidisciplinary approach to combine concepts of biology, plasmas, nanomedicine, robotics, microfluidics, or nanoelectronics.

Facilities

The research is carried out at: CeFEMA-IST, INESC-MN and at IT.

The laboratory facilities include:
Laboratory of Micro and Nanotechnologies of INESC-MN
Laboratory of Nanophysics (at Taguspark campus) of INESC-MN
Laboratory of Liquid Crystals and Condensed Matter (CeFEMA)
Laboratory of Atomic Force Microscopy (DF and INESC-MN)
Laboratory of Semiconductor Materials and Energy Conversion (CeFEMA)
Laboratory of Physics and Technology of Semicnductors (CeFEMA)

Teaching Activities

MSc Curricular Units
Nanotechnologies And Nanoelectronics
Condensed Matter Physics
Micro And Nanofabrication Techniques
Topics In Condensed Matter Physics
Physics Of Liquid Crystals
Condensed Matter Physics Laboratory
Introduction To Spintronics
Physics And Technology Of Semiconductors
Complements Of Electronics
Complements Of Condensed Matter Physics
Nmr Of Partially Ordered Systems
Characterization Methods In Solid State Physics
Physics And Technology Of Magnetic Systems

PhD Curricular Units in Physics
Advanced Condensed Matter Physics
Multiparticle Systems and Critical Phenomena
Advanced Topics in Condensed Matter Physics
Spintronics
Physics of Semiconductor Nanostructures
Advanced Topics in Magnetism
Topics of Physics of Liquid Crystals
Topics of Experimental Condensed Matter Physics
Condensed Matter Physics and Quantum Information

PhD Curricular Units in Engineering Physics
Complements of Microtechnologies
Advanced Characterization of Functional Materials
Microfluidics
Spintronics
Physics of Semiconductor Nanostructures
Advanced Topics in Condensed Matter Physics
Advanced Topics in Magnetism
Topics of Physics of Liquid Crystals
Topics of Experimental Condensed Matter Physics
Condensed Matter Physics and Quantum Information

Members

Pedro Miguel Félix Brogueira, Full Professor (Area Coordinator)
Helena Cristina Ramos Jerónimo Dias Alves
Ana Maria Heleno Branquinho de Amaral, Assistant Professor
Eduardo Filipe Vieira de Castro, Assistant Professor
Carlos Manuel dos Santos Rodrigues da Cruz, Assistant Professor with *Agregação*
António Mário Pereira Ferraz, Assistant Professor
João Luis Maia Figueirinhas, Assistant Professor
Paulo Jorge Peixeiro de Freitas
Susana Isabel Pinheiro Cardoso de Freitas, Assistant Professor
João Carlos Azevedo Gaspar
Diana Cristina Pinto Leitão, Invited Assistant Professor
Umesh Vinaica Mardolcar, Assistant Professor
Ana Maria Guerreiro Martins, Assistant Professor with *Agregação*
José Luís Martins, Full Professor
Luís Viseu Melo, Assistant Professor
Amílcar José Ferros Praxedes, Assistant Professor
Pedro José Gonçalves Ribeiro, Invited Assistant Professor
Pedro Domingos Santos do Sacramento, Associate Professor
Pedro José Oliveira Sebastião, Assistant Professor
Reinhard Horst Schwarz, Associate Professor
António Jorge Duarte de Castro Silvestre, Invited Associate Professor
Vítor Rocha Vieira, Invited Full Professor
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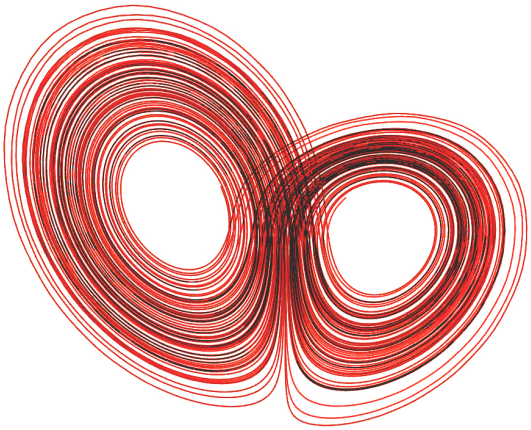
Interdisciplinary Physics



The scientific field of Interdisciplinary Physics studies the behavior of complex systems, microscopic and macroscopic. The fields of study represented in the Department of Physics are: Dynamical Systems, Mathematical Physics, Biophysics, Biophysics Applied Astrophysics, Globe Physics and Geophysics, and Physics of Energy. To respond to a broad spectrum of the challenges of modern society, we specialized in the following areas:

Non-linear dynamics of microscopic and macroscopic physical systems. Celestial mechanics, theory of complexity and chaos, astrophysics and mathematical physics.

Experimental physics and technological applications, detectors developments and medical applications (PET).

Dynamics, evolution and mechanisms of biological/biophysical systems. Multidisciplinary applications of biophysics. Detectors in biophysics.

Study of geophysical processes such as earthquakes, volcanic eruptions and the Earth's magnetic field.

Study and development of sustainable energy systems, from generation through renewable resources to the implementation of energy efficiency.

Lorenz Attractor figure generated using software by Malin Cristersson (www.malinc.se/m/Lorenz.php)

Areas Currently in Focus

Dynamical systems, mathematical physics and biophysics (Prof. Rui Dilão)
Biophysics (Prof. Teresa Pinheiro)
Seismology (Prof. João Fonseca)
Geophysics prospection (Prof. Manuela Mendes)
Technologies for renewable energies (Prof. Filipe Mendes)
High energy dispersion reactions. Elasticity in special relativity
with applications in astrophysics (Prof. João Carlos Fernandes)
Detectors and medical applications (Prof. Paula Bordalo)

Research Units

CERENA, Center for Natural Resources and the Environment
(http://cerena.ist.utl.pt)

CTN, Campus Tecnológico e Nuclear
(http://www.itn.pt)

GDNL, Non-Linear Dynamics Group
(http://sd.tecnico.ulisboa.pt/NonLinear_Dynamics_Group/GDNL.html)

ICIST, Instituto de Engenharia de Estruturas, Território e Construção
(https://fenix.ist.utl.pt/investigacao/icist),

LIP, Laboratório de Instrumentação e Física Experimental de Partículas
(http://www.lip.pt)

Teaching Activities

MSc Curricular Units
Dynamical Systems
Biophysics
Earth Physics
Thermal Solar Energy
Technologies In Energy
Photovoltaic Solar Energy
Energy Service

Members

Rui Dilão, Assistant Professor with *Agregação* (Area Coordinator)
João Carlos Fernandes, Assistant Professor
João Fonseca, Assistant Professor
Filipe Mendes, Assistant Professor
Manuela Mendes, Assistant Professor
Teresa Pinheiro, Invited Assistant Professor

Website

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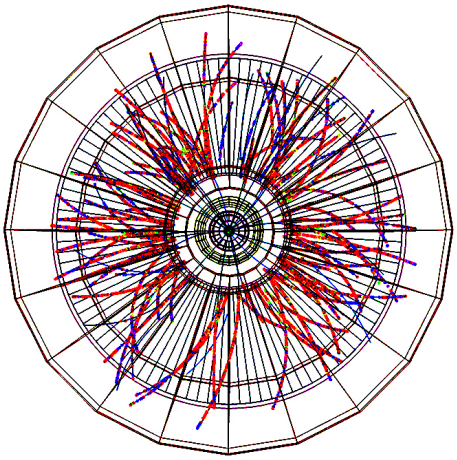
Particle and Nuclear Physics



Particle and Nuclear Physics (PNP) is a major area of science research at IST physics department. Research and PhD programs/projects are done in collaboration with prominent international institutes, such as: CERN , the Pierre Auger Observatory, the Jefferson Lab, important universities of the Iberian peninsula, Valencia/Barcelona/ Madrid, and other big universities of Europe/USA/Japan/India.

Researchers and professors working in PNP also include many people from other nationalities. All researchers belong to one of the Research Units receiving funding support, from FCT - Ministry of Science and the EU. At IST these Research Units include LIP, CFTP, C2TN and a small part of the theory group at CeFEMA. The experimental particle physics and related technologies are developed at LIP that participates in the big experiments at international research infra-structures like ATLAS and CMS at the Large Hadron Collider (LHC) at CERN, the Pierre Auger Observatory in Argentina, the Sudbury Neutrino Observatory (SNO) in Canada and a number of other experiments (COMPASS, LUX, etc). Researchers from LIP were involved in the experiments that led to the Nobel Prizes in Physics in 2013 (Higgs discovery) and 2015 (Neutrino oscillations). On the theoretical side most of the research in theoretical particle physics in Portugal is done at CFTP. Topics are related to the frontiers being pursued in the experimental side, Higgs Physics, Neutrino Physics, Dark Matter, just to name a few. This research is highly internationalized and CERN plays also a major role as a privileged place for the exchange of these ideas.

The scientific works are published in the major international journals for the area, such as: Physics Letters, Physical Review, Astroparticle Physics Journal, JHEP etc.

Original image: CERN

Physics either at the level of a Master of Science (2nd Bologna cycle), or a Ph.D. (3rd Bologna cycle). The usual way to initiate a study is to make first contact directly with one of our researchers/professors.

Teaching Activities

MSc Curricular Units
Particle Physics
Complements of Quantum Mechanics
Nuclear Physics
Group Theory in Physics
Experimental Methods in Particle Physics
Topics in Particle Physics, Astrophysics and Cosmology
Astrophysics Laboratory
Field Theory
Unification Theories
Cosmic Ray Laboratory
Nuclear Instrumentation Techniques
Nuclear Reactions

The PhD Program in Physics of the Department of Physics is designed to provide advanced knowledge and research capabilities in at least one of the scientific areas in which the department is organized. In the area of Particle and Nuclear Physics students can work in national and international scientific centres and laboratories, for instance, the reference laboratory for Particle Physics, the European Organization for Nuclear Research (CERN). They will also profit from the many international collaborations that exist in this very competitive area to start a successful career.

PhD Curricular Units
Advanced Computation in Physics and Engineering
Advanced Experimental Methods in Particle Physics I
Advanced Quantum Field Theory
Advanced Topics in Nuclear Physics I
Advanced Topics in Particle and Astroparticle Physics I
Experimental Methods in Particle Physics
Topics in Particle Physics
Advanced Experimental Methods in Particle Physiscs II
Advanced Topics in Nuclear Physics II
Advanced Topics in Particle and Astroparticle Physics II
Nuclear Physics Methods in Science and Technology
Physics of the Strong/QCD Interaction

National/International Protocols

IDPASC international network. Includes: CERN, CBPF, Doctoral School in Physics of the University of Padua, EGO, IFCA, MAP_Fis, U. Algarve, U. Bari, U. Coimbra, U. Évora, U. Genova, U. Granada, U. Lisboa, U. Nova Gorica, UL-IST, U. Padova-STMS, U. Paris VI - Pierre et Marie Curie, U. Paris VII - Paris Diderot, U. Porto, U. Santiago Compostela, U. Savoie, U. Siena, U. Trento, U. Udine, U. Valencia, U. Salento, SPRACE - UNESP/UFABC, Doctoral School PHENIICS - Université Paris-Saclay.

IDPASC - Portugal PhD program. Includes: Universidade de Lisboa, Universidade de Coimbra, Universidade do Porto, Universidade do Minho, Universidade de Évora, Faculdade de Ciências da Universidade de Lisboa, Instituto Superior Técnico.

Members

Jorge C. Romão, Full Professor (Area Coordinator)
Pedro Abreu, Assistant Professor with *Agregação*
Manuel Peres Alonso, Collaborator
Luís L. Alves, Full Professor
Liliana Apolinário, Collaborator
Pedro Assis, Invited Assistant Professor
Fernando Barão, Assistant Professor
Pedro Bicudo, Assistant Professor with *Agregação*
Marco Cardoso, Invited Assistant Professor
Gustavo Castelo-Branco, Full Professor
Ruben Conceição, Invited Assistant Professor
David Emanuel Costa, Collaborator
Raquel Crespo, Assistant Professor with *Agregação*
Alessandro de Angelis, Full Professor
Samuel Eleutério, Assistant Professor
Pietro Faccioli, Collaborator
Ricardo González Felipe, Invited Associate Professor
Lidia S. Ferreira, Associate Professor with *Agregação*
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Sofia C. Leitão, Collaborator
José Guilherme Milhano, Collaborator
Miguel Reis Orcinha, Collaborator
Teresa Peña, Associate Professor with *Agregação*
Mário Pimenta, Full Professor
Márcia Quaresma, Collaborator
Sérgio Ramos, Assistant Professor with *Agregação*

José Manuel das Neves Rodrigues, Collaborator
João Seixas, Associate Professor with *Agregação*
João P. Silva, Associate Professor with *Agregação*
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Contact

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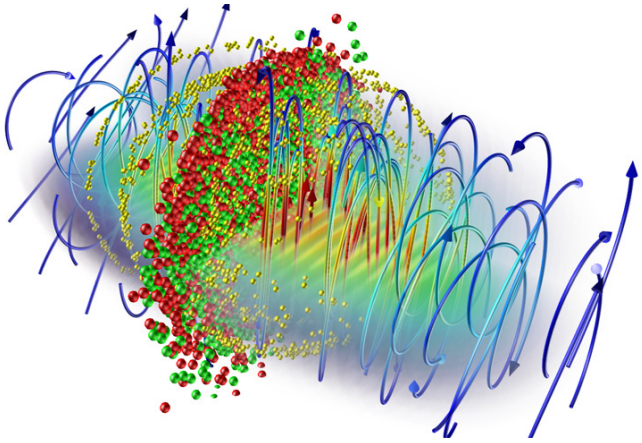
Plasmas, Lasers and Nuclear Fusion



The faculty members of The Scientific Area of Plasmas, Lasers and Nuclear Fusion of the Physics Department of Instituto Superior Técnico (IST) are actively engaged in education, research and outreach programs in a wide range of topics covered by the fields of plasma physics, lasers and nuclear fusion, both from a fundamental perspective and from a technological perspective.

Besides collaborating in the undergraduate Physics course for all IST 1st and 2nd cycle degrees, our faculty members are responsible for several courses in the Integrated Master Degree in Technological Physics Engineering in our topics of expertise. We are also strongly involved in the PhD degrees of Physics and Technological Physics Engineering, leading the FCT PhD Program APPLAuSE.

The research of the faculty members is developed at the Institute of Plasmas and Nuclear Fusion, an Associated Laboratory, and the only Physics (and IST) Research Unit evaluated as Outstanding. The vibrant research programme has led to several high impact publications in general physics journals (e.g. Nature Physics, Nature Comm, Phys. Rev. Lett.) and in the speciality journals in Plasma Physics, Optics and Nuclear Fusion, and to several high profile research grants at the national and at the international level.

Our faculty members have been recognised with several prizes and awards, and most notably in 2015 the T. H. Stix Award from the American Physical Society was awarded to Prof. Nuno Loureiro. Several of our PhD students have received prizes at conferences, delivered invited talks at international conferences, and have secured post doctoral positions in leading institutions worldwide.

The faculty members are also engaged in outreach programs targeted at high school

Image: Thomas Grismayer/GoLP – Group for Lasers and Plasmas/IPFN

students, undergraduate students and the general public.

All these activities leverage on long standing international partnerships and research contracts with leading institutions in our fields of expertise.

Teaching Activities

MSc Curricular Units
Waves and Instabilities in Plasmas
Thermodynamics and the Structure of Matter
Diagnostic and Measurement Techniques
Statistical Physics
Project MEFT
Plasma Technologies for Materials Processing
Plasma Physics and Technology
Plasma Kinetic Theory
Physics of Continuous Media
Nuclear Fusion
Microcontrollers
Instrumentation
Gas Discharges
Real Time Control
Advanced Experimental Physics Laboratory

PhD Curricular Units
Fundamentals of Plasma Physics, Nuclear Fusion and Lasers
Diagnostic Methods for Plasmas
Advanced Topics in Plasma Physics, Nuclear Fusion and Lasers
Advanced Computing in Physics and Engine

Members

Luís Miguel de Oliveira e Silva, Full Professor (Area coordinator)
Luís Paulo da Mota Capitão Lemos Alves, Full Professor
João Pedro Saraiva Bizarro, Assistant Professor with *Agregação*
Bernardo Brotas de Carvalho, Assistant Professor
Marta Leitão Mota Fajardo, Assistant Professor
Horácio João Matos Fernandes, Associate Professor with *Agregação*
Gonçalo Nuno Marmelo Foito Figueira, Assistant Professor

Bruno Miguel Soares Gonçalves, Assistant Researcher with *Habilitação*
Vasco António Dinis Leitão Guerra, Associate Professor with *Agregação*
Jorge Manuel Amaro Henriques Loureiro, Associate Professor with *Agregação*
Nuno Filipe Gomes Loureiro, Invited Associate Professor
Artur Jorge Louzeiro Malaquias, Assistant Professor
João Alberto dos Santos Mendanha Dias, Assistant Professor
Carlos Alberto Nogueira Garcia Silva, Assistant Researcher with *Habilitação*
Mário António Prazeres Lino da Silva, Invited Assistant Professor

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Part 3 / Scientific Activities

Research Seminars

January 8
Heavy Flavour Results From LHC Run I
Nuno Leonardo
LIP

January 22
Jets In Heavy-Ion Collisions: Interplay Between Theory And Experiment
Liliana Apolinário
Instituto Superior Técnico

February 2
Electronic Confinement Due To A Huge Spatially Modulated Spin-Orbit Coupling
Héctor Ochoa
Donostia International Physics Center an Sebastián

February 5
Search For A Charged Higgs Boson At CMS
Pietro Vischia
Instituto Superior Técnico

February 19
Testing Gravity With Astrophysical Observations
Leonardo Gualtieri
Università di Roma

March 5
CLIC: Physics And Detectors At A Future TeV-scale e+e- Linear Collider
Lucie Linssen
CERN

March 5
Hawking Radiation In Bose-Einstein Condensates
Antonin Coutant
Max Planck Institute for Gravitational Physics

March 12
Digging Out The Little Red Gems: M Dwarfs in the VVV b201 Tile
Bárbara Rojas-Ayala
IA-CAUP

Image: Luís Ferreira

March 12
New Approaches In Science Communication At The CERN Media Lab
João Pequenão
CERN Media Lab

March 25
New Physics At Icecube
Paratma S. Bhupal Dev
University of Manchester

March 25
Universal Single-Frequency Oscillation Of The Entanglement Spectrum After A Local Quench
Abolfazl Bayat
University College London

March 26
On Multi Black Hole Systems In 5 Dimensions
Cristian Stelea
Universitatea Alexandru Ioan Cuza

April 8
Power And Strangeness Of The Quantum
Serge Haroche
Collège de France

April 9
Large Nonlinear Effects In Gravitational Wave Observables
Abraham I. Harte
AEI

April 16
Shaken, Not Stirred: Kinetic Mixing In Scalar-Tensor Theories
Dario Bettoni
Technion

April 21
On Landauer Principle For Non-Equilibrium Quantum Systems
Mauro Paternostro
Queen's University Belfast.

April 23
Asymptotic Safety And Cosmology: Some Successes And Challenges For The Future
Ippocratis D. Saltas
CAAUL

April 23
Detector Concept For The FCC-HH And A Proposal For The Hadron Central Calorimeter
Ana Henriques
CERN

April 30
Spherically Symmetric Conformal Gravity And Gravitational Bubbles
Victor Berezin
NR RAS

May 6
I-Love-Q And Follicly Challenged Neutron Stars
Kent Yagi
Montana State University

May 12
What Does Large Nc QCD Tell Us About Tetraquarks?
Thomas Cohen
University of Maryland

May 26
Inflaton Dark Matter From Incomplete Decay
João Rosa
Universidade de Aveiro

May 28
Causality, Hyperbolicity And Shock Formation In Lovelock Theories
Norihiro Tanahashi
DAMTP

May 28
Features And Goals Of The JUNO Neutrino Oscillation Experiment
Gioacchino Ranucci

June 1
Reflections on Quantum Data Hiding
Andreas Winter
Universitat Autònoma de Barcelona

June 4
General Relativistic Simulations Of Binary Neutron Star Mergers
Bruno Giacomazzo
University of Trento

June 4
Majorana Fermions And Topological Quantum Computing
Louis H. Kauffman
U. Illinois at Chicago

June 23
Working With Symmetries Efficiently: Toolkit For bSM Model Building
Igor Ivanov
CFTP/ Instituto Superior Técnico

June 26
Graphene And Beyond: Electronic Properties Of Novel 2D Materials
Eduardo Castro
CeFEMA and Tecnico, ULisboa

June 30
Tetraquarks: Why They Are So Difficult To Model
Pedro Bicudo
CFTP/Instituto Superior Técnico

July 1
LHC Benchmarks For The CP-Conserving Two-Higgs-Doublet Model
Howard Haber

July 7
S3 Symmetry And The Origin Of Cabibbo Mixing
Dipankar Das
Saha Institute of Nuclear Physics

July 10
Exciton-polariton Condensates
Sven Höfling
Wuerzburg University and University of St Andrews

July 13
Highlights Of Three Years Of LHC Physics
João Varela
LIP/IST/CERN

July 13
Recent Developments In Family And CP Symmetries
Ivo de Medeiros Varzielas

July 14
Vacuum Controls At CERN
Paulo Gomes
CERN

July 17
Application Of Distributed Semi-quantum Computing Model In Phase Estimation
Daowen Qiu
Sun Yat-sen University

July 21
Interpreting LHC New Physics Searches
Sabine Kraml
LPSC Grenoble

July 22
Origins Of Big Bang Cosmology, 1917-1934
Alexei Kojevnikov
University of British Columbia

July 23
Quantum State Routing And Many-qubit Quantum State Transfer Via A Single Channel
Tony Apollaro, NEST - CNR & Università degli Studi di Palermo

July 29
Relativistic Quantum Information Theory
Niaz Ali Khan
Universidade do Porto

September 3
Spontaneous Scalarization: Asymmetron As Dark Matter
Teruaki Suyama
University of Tokyo

September 11
Pretty Good State Transfer Of Entangled States Through Quantum Spin Chains
Rúben Sousa
Instituto Superior Técnico

September 17
Finding Self-Force Quantities In A Post-Newtonian Expansion: Eccentric Orbits On A Schwarzschild Background
Seth Hopper
University College Dublin and University of North Carolina

September 24
Phenomenology Of The Accelerating Universe
Federico Piazza
CPT, Aix-Marseille

September 24
Covariant R_xi Gauge Fixing In Lattice QCD
Pedro Bicudo
CFTP/Instituto Superior Técnico

September 25
What's Next After Moore's Law: Quantum Computing
John Martinis
University of California and Google Inc.

October 1
A Few Sigma Deviations From SM After The LHC Run 1
Igor Ivanov
CFTP/Instituto Superior Técnico

October 2
Building Quantum Machines Out Of Light
Ian Walmsley
University of Oxford

October 8
Yukawa-Coupling Matrices In SO (10) GUTs With Flavour Symmetries
Luís Lavoura
CFTP/IST/Univ. Lisboa

October 8
*Electrodynamics Of A Dark Flui*d
Alexander B. Balakin
Kazan Federal University

October 9
The Most Bizarre Two Higgs Doublet Model Ever
Marc Sher
College of William and Mary

October 9
Quantum Machine Learning
Masoud Mohseni
Google Quantum Artificial Intelligence Lab

October 15
Complex 2HDM With Broken Z2
Jorge Romão
CFTP/Instituto Superior Técnico

October 15
Testing The Standard Cosmological Model With Model-Independent Parametrizations: Some Issues
Diego Saez-Gomez
CAUL

October 16
New Quantum Key Distribution platform based on the Coherent One Way Protocol
Grégoire Ribordy
ID Quantique

October 20
Finite Unified Theories: A Successful Example Of Reduction Of Couplings
George Zoupanos
National Technical
University of Athens

October 21
Facets Of Superradiance In The Strong Gravity Regime
Helvi Witek
Nottingham University

October 22
Electromagnetic Neutrinos: Theory And Phenomenology
Alexander Studenikin
Moscow State University
& JINR-Dubna

October 22
Muon g-2 In 2HDMs
Eung Jin Chun
Korea Institute
for Advanced Study

October 22
Semiclassical S-Matrix For Black Holes
Sergey Sibiryakov
CERN

October 23
Vibrations, Quanta And Biology
Martin Plenio
Ulm University

October 23
Gravimetry With Cold Atoms
Andrew Hinton
University of Birmingham

October 29
Covariant Spectator Theory: Introduction And An Application
Elmar Biernat

October 29
Spontaneous Scalarization In Anistropic Stars
Caio Macedo
Centra-IST

October 30
Spin Qubits In Gate Defined Gaas Quantum Dots – From Dephasing Due To Nuclear Spins To Scalable Control
Hendrik Bluhm
Aachen University

Ocotober 30
Effect Of Disorder In Non-Uniform Hybrid Nanowires With Majorana And Fermionic Bound States.
Zhen-Hua Wang
Beijing Computational Science
Research Center

November 3
High Scale Unification Of CKM And Pmns Mixing Matrices
Rahul Srivastava
Inst. Of Math. Science Chennai

November 4
Relativistic Quark-Model Description Of Low-Energy Baryons
Willibald Plessas
University Of Graz

November 5
Quarkonia And Heavy-Light Mesons In A Covariant Quark Model
Sofia Leitão
CFTP/Instituto Superior Técnico

November 5
Modified Gravity Inside Astrophysical Bodies
Ryo Saito
APC, Paris

November 5
Surface-Assisted Formation Of Graphene Nanoribbons On Au
Cláudia Cardoso
Centro S3
CNR-Istituto Nanoscienze

November 6
Electroweak Vacuum Stability And Inflation Via Non-Minimal Derivative Couplings To Gravity
Cristiano Germani
Universidade de Barcelona

November 6
Measurements Not Restricted By The Heisenberg Uncertainty Principle
Eugene Polzik
University of Copenhagen

November 6
Topological Phases And Phase Transitions In Low Dimensional Lattice Models
Linhu Li
Beijing Computational Science Research Center

November 12
From Floquet To Dicke: Quantum Spin-Hall Insulator Interacting With Quantum Light
Balazs Dora
Budapest University

November 12
Group-Theoretic Protection Against CP Violation In Multi-Higgs Models
Igor Ivanov
CFTP/Instituto Superior Técnico

November 12
New Measurements Of Cosmological Parameters From Gamma-Ray Bursts
Luca Izzo
Università Di Roma

November 19
Flavored Dark Matter
Jennifer Kile
CFTP/Instituto Superior Técnico

November 19
The Cosmological Constant Problem (And Its Sequester)
Antonio Padilla
University Of Nottingham

November 26
Chiral Symmetry Restoration In Highly Excited Baryons
Marco Cardoso
CFTP/Instituto Superior Técnico

November 27
Quantum Walks In Synthetic Gauge Fields With 3D Integrated Photonics
Leonardo Novo
IT and Instituto Superior Técnico

November 30
Towards Networked Quantum Memories on Photonic Integrated Circuits
Dirk Englund
MIT

December 3
Anomaly-Free Chiral Fermion Sets And Gauge Coupling Unification
Luis Cebola
CFTP/Instituto Superior Técnico

December 3
On The Flavor Composition Of The IceCube Neutrinos
Sergio Palomares-Ruiz
IFIC, CSIC-U. Valencia

December 4
Polymers And Nanomaterials
Gisele Iulianelli
Univ. Federal do Rio de Janeiro

December 4
The 2D Bose Gas, In And Out Of Equilibrium
Jean Dalibard
Collège de France

December 10
Near-Horizon Geometry Of Extremal Magnetised Kerr-Newman Black Holes And Meissner Effect
Filip Hejda
Centra/Instituto Superior Técnico

December 11
Lepton Number Violating Minimal Dark Matter
Daniel Wegman
University Of Liège

December 15
Modeling Dynamics Of Engineered Atomic Structures With Master Equations
Alexey Shakirov
Russian Quantum Center and Lomonosov Moscow State Univ.

December 29
Quantum Quench In AdS/CFT And Field Theory
Sumit R. Das
University Of Kentucky

Colloquia

March 4
Beauty Quarks And Rare Processes At The LHC
Nuno Leonardo,
LIP/CMS B Physics convener

March 11
O Novo MEFT
Pedro Brogueira,
Instituto Superior Técnico

March 18
Highly Luminescent Nanomaterials For Laser Scanning Microscopy
José Paulo Farinha
CQFM – IN, IST

March 25
Detecting Magnetic Fields: From Computers To Brain
Susana Cardoso
INESC-MN & IST

April 10
Collisionless Magnetic Reconnection In The Solar Corona
Joerg Buecher

April 10
IST Is Cool - Plasma Physics Near Absolute Zero
Tito Mendonça
Insituto Superior Técnico

April 15
Solar Potential In The Cityscape
Miguel Centeno Brito
Faculdade de Ciências da Universidade de Lisboa

April 22
HiSPARC: Undergraduate Research, Outreach And Development
Filipe Freire
Instituut-Lorentz For Theoretical Physics, Univ. Leiden

April 29
Tokamak Fusion Plasmas And Modelling Infrastructures
Rui Coelho
Instituto de Plasmas

May 11
High Energy Density Physics In The Laboratory
Gianluca Gregori
Oxford University

May 20
Light Forces
Heinrich Hoerber
University Of Bristol

May 27
Topological Matter And Why You Should Be Interested
Steve Simon
Oxford University

June 16
Laser Particle Acceleration With Femtosecond PW Lasers
Chang Hee Nam
Institute for Basic Science
GIST, South Korea

June 18
Coherent Control Over Laser Wakefield Acceleration
Vishwa Bandhu Pathak
Institute for Basic Science
GIST, South Korea

July 1
Perpendicular Magnetic Anisotropy: From Ultralow Power Spintronics To Cancer Therapy
Russell Cowburn
University Of Cambridge

September 24
Huygens Synchronization Of Two Clocks
Luís Viseu Melo
Instituto Superior Técnico

October 14
The 2015 Nobel Prize In Physics
Heinrich Hoerber
University Of Bristol

October 21
A Concise Inventory Of Printable/ Flexible/Stretchable Sensors: Technologies And Applications For High Volume Applications
Roger H. Grace
Roger Grace Associates

October 28
Pendulum Clocks Hanging From A Wall: A Synchronization Mystery From Huygens
Luís Viseu Melo
Instituto Superior Técnico

November 4
Luminescent Wide Bandgap Nanomaterials
Teresa Monteiro
Universidade de Aveiro

November 11
From High-Speed AFM to 4π Holographic AFM
Mervyn Miles
HH Wills Physics Laboratory
University of Bristol

November 18
Physical Approaches For The Study Of Insect Embryo Development
Ivo Telley
Instituto Gulbenkian De Ciência

November 25
Magnetic Tunnel Junction Devices And Applications: From Basic Research To Production
Ricardo Ferreira
International Nanotechnology Laboratory, Braga

November 26
New Opportunities In High Energy Density Physics Research
Peter Norreys

November 27
Catch The Perfect Wave!
Ramon Laureano, Joana Andrade, João Guedes

December 2
Cloning The Higgs
João Paulo Silva
CFTP/Instituto Superior Técnico

December 9
Neutrinos Have Mass! And So What?
Filipe Rafael Joaquim
CFTP/Instituto Superior Técnico

December 10
Perspectives Of Laser Plasma Acceleration At The L2A2 Lab At The Universidade De Santiago De Compostela
Camilo Ruiz Méndez

Conferences and Workshops

February 2 - 6
Compact Objects
As Astrophysical And
Gravitational Probes
Leiden, The Netherlands

February 8 – 21
2015 IDPASC School
Université Pierre et Marie Curie & Université Paris Diderot
Paris, France

March 8 – 14
Excited QCD 2015
Tatranska Lomnica, Slovakia

March 13
The Light in Physics
Universidade de Lisboa
Lisbon, Portugal

April 20 – 24
ANIMMA 2015
Lisbon Congress Center
Lisbon, Portugal

June 10 - 12
One Hundred Years
Of Strong Gravity
Instituto Superior Técnico
Lisbon, Portugal

July 13 - 14
Gravitational Fields With Sources:
From Compact Objects
To Black Holes
Rome, Italy

July 22 – 26
EPS 2015
Centro Cultural de Belém
Lisbon, Portugal

July 23 - 24
ENAA 2015
Lisbon, Portugal

August 26 – 29
The Future Of Research
Oncosmic Gamma Rays
La Palma, Canary Islands

September 1 – 11
CORFU 2015: Summer School
And Workshop On The Standard
Model And Beyond
Corfu, Greece

September 7 - 11
SPINICUR Summer School
on Spin Currents,
INL
Braga, Portugal

September 28 – October 2
TWEPP 2105 - Topical Workshop
On Electronics For Particle Physics
Lisbon, Portugal

October 5 - 8
7th MARTA Progress Meeting
Lisbon, Portugal

October 5 - 8
European Fusion Theory
Conference 2015
Lisbon, Portugal

October 24 - 31
The Standard Theory And
Beyond In The LHC Era
Albufeira, Portugal

October 30 - 31
IDPASC - Workshop on
“Space Particles and Earth”
University of Évora

November 2015
Magnetrodes Workshop,
Academia das Ciências.
Lisbon , Portugal

December 18
Mini-Workshop on Theoretical
Condensed Matter Physics
Instituto Superior técnico
Lisbon, Portugal

December 18 - 19
GR 100 Years In Lisbon
Lisbon, Portugal

December 21 - 22
VIII Black Holes Workshop
Lisbon, Portugal

Outreach

The Department of Physics has been organizing various activities to promote science and technology. What follows is a selected list of our department's outreach efforts during 2015:

The International Masterclasses in Particle Physics occurred in 14 sessions at Aveiro, Beja, Braga, Bragança, Coimbra, Covilhã, Évora, Faro, Lisboa (2 places and 3 sessions), Ponta Delgada (Azores Islands), Porto, Vila Real, and with our remote support in São Tomé and Príncipe. The total number of participants was of the order of 2000, constituting the largest participating country in the activity.

The CERN Portuguese Language Teachers Programme happened in the first week of September with an important support from CERN and Ciência Viva for 24 Portuguese teachers, 20 teachers from Brazil, 2 from Mozambique, 2 from East Timor, 1 from Cape Verde and 1 from São Tomé and Príncipe.

Teacher formation in Experimental Physics for the science exhxibition "Física no dia-a-dia" na Escola, a science itinerancy project from "Mundo na Escola" for the Ministry of Education and Science. Liceu Amilcar Cabral, Assomada, Cape Verde and Escola Portuguesa de Moçambique, Maputo, Mozambique.

Visits to IPFN laboratories (high school students, IST students, special guests of IST).

Collaboration with the Board of Engineering Students BEST INSIDE VIEW day hosting 3 students from IST for one day, so they can have an experience on a engineering environment. May-June.

Image: Instituto de Plasmas e Fusão Nuclear

Illuminations – A text based installation about the origin of ideas in Science at the Department of Physics, June 8 -13.

MEFT new student presentations: "Microtecnologias: Engenharia num Chip", June 25 - 26.

Plasma Surf - Summer school for undergraduate students, July 12 - 17.

IPFN participation in the program "Ciência Viva no Verão", July 13 - 17.

In the scope of the Ciência Viva's program "Ciência Viva no Verão", LIP proposed 3 internships in Lisboa and 3 internships in Coimbra, that received 18 and 6 students.

Workshop for high school teachers on lasers, August 31- September 3.

Collaboration with Ciência Viva and the newspaper *i*, "Saberás tu..."

"Porque é que dois relógios de pêndulo pendurados numa parede acabam por se sincronizar?", H.M. Oliveira and L. V. Melo, newspaper *i*, "Saberás tu" September 11.

INESC-MN participation in TechDays-Aveiro, September 17 - 18.

4º Encontro MEFT - Desafiar os Limites da Ciência e da Tecnologia.

"Espaço vai à Escola" Week, organised by Ciência Viva and european space education resource office, October.

Coordination of INESC-MN participation in the ICT-2015 event with a Showroom (selected out of 125 from European partners) – Lisbon, October 20 - 22.

The ATHENS course, 16 - 20 November.

Organization of Semana da Ciência e Tecnologia at INESC-MN, November 26.

Conference "Haja Luz- Diálogos à volta da Luz", F. Calouste Gulbenkian, December.

Gravitão - a website about all matters having to do with gravitation, for high school students or science enthusiasts. (blackholes.tecnico.ulisboa.pt/gravitao)

About 25 schools organized visits to CERN and more than 30 outreach talks were given at the secondary schools.

The 30 years of Portugal's accession to CERN were celebrated.

Celebration of the 30 years of LIP, with a large exhibition on the big challenges of particle physics for the next decades

Scientific Publications

"Improved Limit To The Diffuse Flux Of Ultrahigh Energy Neutrinos From The Pierre Auger Observatory". Aab A. et al.(The Pierre Auger Collaboration), Physical Review D91 (2015) no.9, 092008.

"Search For Patterns By Combining Cosmic-Ray Energy And Arrival Directions At The Pierre Auger Observatory". Aab A. et al. (The Pierre Auger Collaboration, European Physical Journal C75 (2015) no.6, 269.

"Searches For Anisotropies In The Arrival Directions Of The Highest Energy Cosmic Rays Detected By The Pierre Auger Observatory", Aab A. et al. (Pierre Auger Collaboration), Astrophysical Journal 804 (2015) no.1, 15.

"Large Scale Distribution Of Ultra High Energy Cosmic Rays Detected At The Pierre Auger Observatory With Zenith Angles Up To 80 Degrees". Aab A., et al. (The Pierre Auger Collaboration), Astrophysical Journal 802.2 (2015): 111.

"Publisher'S Note: Muons In Air Showers At The Pierre Auger Observatory: Mean Number In Highly Inclined Events". Aab, A. et al. Physical Review D 91.5 (2015).

"Combined Measurement Of The Higgs Boson Mass In P P Collisions At S = 7 And 8 Tev With The ATLAS And CMS Experiments". Aad, G. et al. Physical Review Letters 114.19 (2015).

"The Compass Setup For Physics With Hadron Beams". Abbon P et al. Nuclear Instruments & Methods In Physics Research Section A779 (2015) 69-115.

Image: Técnico Lisboa

"Study Of W Boson Production In Ppb Collisions At Root(Nn)-N-S=5.02 Tev". Adam, W. Physical review letters (2015).

"Odd and Even Partial Waves of ηπ− and η'π− in π−p→η(')π−p at 191GeV/c". Adolph C et al. Physics Letters B 740 (2015): 303-311.

"Collins And Sivers Asymmetries In Muonproduction Of Pions And Kaons Off Transversely Polarised Protons". Adolph, C. et al. Physics Letters B 744 (2015): 250-259.

"Search For Exclusive Photoproduction Of (3900) At COMPASS". Adolph, C. et al. Physics Letters B 742 (2015): 330-334.

"Precision Measurement Of The Helium Flux In Primary Cosmic Rays Of Rigidities 1.9 GV To 3 TV With The Alpha Magnetic Spectrometer On The International Space Station". Aguilar, M. et al. Phys. Rev. Lett. 115.21 (2015).

"Precision Measurement Of The Proton Flux In Primary Cosmic Rays From Rigidity 1 GV To 1.8 TV With The Alpha Magnetic Spectrometer On The International Space Station". Aguilar, M. et al. Phys. Rev. Lett. 114.17 (2015).

"Transverse Electron-Scale Instability In Relativistic Shear Flows". Alves, E. P. et al. Physical Review E 92.2 (2015).

"Experimental And Theoretical Study Of Atmospheric-Pressure Argon Microplasma Jets". Amorim, J, Ridenti M. A., and Guerra, V. Plasma Phys. Control. Fusion 57.7 (2015): 074001.

"Medium-Induced Gluon Radiation And Colour Decoherence Beyond The Soft Approximation". Apolinário, L. et al. Journal of High Energy Physics 2015.2 (2015).

"Total Ionizing Dose (TID) Evaluation Of Magnetic Tunnel Junction (MTJ) Current Sensors". Arias, S. I. R. et al. Sensors and Actuators A: Physical 225 (2015): 119-127.

"Kinematic Bias On Centrality Selection Of Jet Events In Ppb Collisions At The LHC". Armesto, N., Gülhan, D. C., and Milhano. J. G. Physics Letters B 747 (2015): 441-445.

"Assessment Of The Occupational Exposure In Real Time During Interventional Cardiology Procedures". Baptista, M. et al. Radiat Prot Dosimetry 165.1-4 (2015): 304-309.

"Environmental Effects For Gravitational-Wave Astrophysics". Barausse, E., Cardoso, V., and Pani, P. J. Phys.: Conf. Ser. 610 (2015): 012044.

"Determination Of The 9Be (3He,Pi) 11B (I=0,1,2,3) Cross Section At 135° In The Energy Range 1–2.5 Mev". Barradas, N.P. et al. Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms 346 (2015): 21-25.

"Assessment Of Dye Distribution In Sensitized Solar Cells By Microprobe Techniques". Barreiros, M.A. et al. Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms 348 (2015): 255-259.

"Detecting Antibody-Labeled BCG Mnps Using A Magnetoresistive Biosensor And Magnetic Labeling Technique". Barroso, T. R.G. et al. JNanoR 34 (2015): 49-60.

"Data Acquisition Remote Node Powered Over The Communications Optical Fiber". Batista, A. J.N., Sousa, J., and Gonçalves, B. Fusion Engineering and Design 96-97 (2015): 64-69.

"Measurement-Assisted Quantum Communication In Spin Channels With Dephasing". Bayat, A. and Omar, Y. New Journal of Physics 17.10 (2015): 103041.

"Optimization Of A Lower Hybrid Current Drive Launcher For ITER". Belo, J. H.C.M. et al. Fusion Engineering and Design 96-97 (2015): 70-76.

"Photoluminescence Studies Of A Perceived White Light Emission From A Monolithic Ingan/Gan Quantum Well Structure". Ben Sedrine, N. et al. Sci. Rep. 5 (2015): 13739.

"Density Impact On Toroidal Rotation In Tore Supra: Experimental Observations And Theoretical Investigation". Bernardo, J. et al. Plasma Phys. Control. Fusion 57.3 (2015): 035002.

"Testing General Relativity With Present And Future Astrophysical Observations". Berti, E. et al. Class. Quantum Grav. 32.24 (2015): 243001.

"Ultrahigh-Energy Debris From The Collisional Penrose Process". Berti, E., Brito, R., and Cardoso, V. Phys. Rev. Lett. 114.25 (2015).

"Charge-Conjugation Symmetric Complete Impulse Approximation For The Pion Electromagnetic Form Factor In The Covariant Spectator Theory". Biernat, E. P. et al. Physical Review D 92.7 (2015).

"A Thermodynamical Analysis Of Rf Current Drive With Fast Electrons". Bizarro, J. P. S. Physics of Plasmas 22.8 (2015): 082510.

"Friction In Macroscopic Thermodynamics: A Kinetic Point Of View". Bizarro, J. P. S. Annals of Physics 363 (2015): 457-475.

"Scaling Properties Of Weakly Self-Avoiding Fractional Brownian Motion In One Dimension". Bock, Wolfgang et al. Journal of Statistical Physics 161.5 (2015): 1155-1162.

"Neutrino Mass And Invisible Higgs Decays At The LHC". Bonilla, C., Romão, J. C., and Valle. J. W. F. Physical Review D 91.11 (2015).

"NMR Relaxometry Evaluation Of Nanostructured Starch-PLA Blends". Brito, L. M., Sebastião, P. J. O., and Tavares M. I. Polymer Testing 45 (2015): 161-167.

"Accretion Of Dark Matter By Stars". Brito, R., Cardoso, V., and Okawa, H. Phys. Rev. Lett. 115.11 (2015).

"Black Holes As Particle Detectors: Evolution Of Superradiant Instabilities". Brito, R., Cardoso,V., and Pani, P. Class. Quantum Grav. 32.13 (2015): 134001.

"Microbiological And Compositional Features Of Green Stains In The Glaze Of The Portuguese 'Great View Of Lisbon' Tile Panel". Cabo Verde, S. et al. J Mater Sci 50.20 (2015): 6656-6667.

"The Eastern Lower Tagus Valley Fault Zone In Central Portugal: Active Faulting In A Low-Deformation Region Within A Major River Environment". Canora, C. et al. Tectonophysics 660 (2015): 117-131.

"Fe(III) Saleen Derived Schiff Base Complexes As Potential Contrast Agents". Cardoso, B. de P. et al. Inorganica Chimica Acta 432 (2015): 258-266.

"Black Holes In Anti–De Sitter Spacetime: Quasinormal Modes, Tails, And Flat Spacetime". Cardoso, V. and Khanna, G. Phys Rev D 91.2 (2015).

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"The Secret Life Of Scientific Ideas". Cardoso, V. Physics World 28.9 (2015): 30-32.

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"Silica And Silica Organically Modified Nanoparticles: Water Dynamics In Complex Systems". Carvalho, A. et al. Microporous and Mesoporous Materials 217 (2015): 102-108.

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"PCI Express Hotplug Implementation For ATCA Based Instrumentation". Carvalho, P. F. et al. Fusion Engineering and Design 96-97 (2015): 738-741.

"Anderson Localization And Topological Transition In Chern Insulators". Castro, E. V., López-Sancho M. P., and Vozmediano, M. A. H. Phys. Rev. B 92.8 (2015).

"Confronting Predictive Texture Zeros In Lepton Mass Matrices With Current Data". Cebola, L. M., Emmanuel-Costa, D., and González F., R. Physical Review D 92.2 (2015).

"Search For New Physics In Events With Same-Sign Dileptons And Jets In Pp Collisions At Root S = 8 Tev". Chatrchyan S. et al. Journal Of High Energy Physics 1401 (2014) 163, Erratum: Journal Of High Energy Physics 1501 (2015) 014.

"Study Of Z Production In Pbpb And Pp Collisions At Root S(Nn)=2.76 Tev In The Dimuon And Dielectron Decay Channels". Chatrchyan S. et al. Journal Of High Energy Physics 1503 (2015) 022.

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"The Average Longitudinal Air Shower Profile: Exploring The Shape Information". Conceição, R. et al. J. Phys.: Conf. Ser. 632 (2015): 012087.

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Books

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Honours and Awards

Ordem de Sant'Iago da Espada title for Prof. Vitor Cardoso, for scientific achievements, awarded by the President of the Portuguese Republic, Aníbal Cavaco Silva.

ERC Consolidator Grant, for outstanding researchers in any research field in Europe, in 2015, to Professor Vitor Cardoso. Awarded by the European Research Council.

The 2015 Thomas H. Stix Award for Outstanding Early Career Contributions to Plasma Physics Research was awarded to Prof. Nuno Loureiro.

The "Outstanding Referee" award from American Physical Society was awarded to Professor Vitor Cardoso and to Dr. Paolo Pani.

Professor João Paulo Ferreira da Silva was honoured with the Instituto Superior Técnico Outstanding Teaching Award.

And the following faculty were recognized for their excellence in teaching:

Amílcar José Ferros Praxedes

Ana Maria Vergueiro Monteiro Cidade Mourão

Diana Cristina Pinto Leitão

João Paulo Ferreira da Silva

Image: Presidência da República Portuguesa

Luís Filipe Moreira Mendes

Mário José Gonçalves Pinheiro

Pedro José Oliveira Sebastião

Samuel Rodrigues Martins Eleutério

Sofia Isabel Cardoso de Almeida Leitão

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Faculty

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Research Areas & Interests:
Pedro Abreu works on data analysis and algorithms at the Pierre Auger Observatory, and on communication and outreach in particle and astroparticle physics at LIP. He has been President of the South and Isles delegation of the Portuguese Physics Society since 2010.

Selected References:
P. Abreu, S. Andringa, F. Diogo, M. Espírito Santo, "Questions And Answers In Extreme Energy Cosmic Rays – A Guide To Explore The Data Set Of The Pierre Auger Observatory", Nuclear and Particle Physics Proceedings 273-275 (2016): 1271-1275. doi: 10.1016/j.nuclphysbps.2015.09.203

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Research Areas & Interests:
Luís L. Alves works in the modeling and simulation of low-temperature plasmas. He has developed different numerical codes, extending from the numerical solution of the electron Boltzmann equation to the development of multi-dimensional dynamic models for reactive gas/plasma systems. His research focuses on the study of microwave and radio-frequency discharges, of interest for material science, biological and environmental applications. He is the Head of the Gas Discharges and Gaseous Electronics group of IPFN. He has published more than 70 papers in international journals and books and he has supervised more than 15 PhD and MSc theses.

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L.L. Alves et al, "Capacitively Coupled Radio-Frequency Discharges In Nitrogen At Low Pressures", Plasma Sources Sci. Technol. 21, 045008 1-19 (2012). doi: 10.1088/0963-0252/21/4/045008

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Research Areas & Interests:
The research activities of Ana Branquinho de Amaral have been focused on materials deposition by thin film technology and electronic device production, namely solar cells, sensors, TFTs. At an early stage, most of her work consisted in the optimization of electro-optical properties of hydrogenated amorphous silicon for solar cells application. Afterwards, her work became more focused on transparent conductive oxides using a new deposition technique, developed in her research group, for applications in transparent flexible electronics. More recently her work has been devoted to the production of c-Si devices (solar cells, n-MOSFETs and p-MOSFETs) using the low temperature pre-deposition method. She is responsible for the "Laboratório de Materiais Semicondutores e Conversão de Energia" since 1996. She has published 52 papers in international journals.

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Research Areas & Interests:
Pedro Assis specializes in experimental particle and astroparticle physics. His work has been developed in the context of several international collaborations developing data acquisition systems for which he has taken great responsibilities. P. Assis is member of the Auger Collaboration and has authored papers with great impact on CR astrophysics. P. Assis also participates in LIP activities with the European Space Agency to study the radiation environment in space and it effects in components. P. Assis has published 55 papers in international peer review journals and 25 papers in proceedings of international conferences. Researcher ID gives a sum of the times cited of 2555 with an h-index of 19. Has authored more than 250 proceedings as an Auger Collaborator.

Selected References:
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Research Areas & Interests:
Fernando Barão is working on astro-particle experiments since more than 15 years. He is leader of the portuguese group that is part of the AMS experiment, that orbits around earth on the international space station, since 2011. The portuguese group made major contributions for the design, study and operation of the ring imaging cerenkov detector that integrates the AMS detector. He is also the responsible of the cosmic ray laboratory at IST that allow students to develop detector and simulation projects for cosmic rays detection.

Selected References:
M. Aguilar et al., "Precision Measurement Of The Proton Flux In Primary Cosmic Rays From Rigidity 1GV To 1.8 TV With The Alpha Magnetic Spectrometer On The International Space Station", Phys. Rev. Lett. 114, 171103, (2015) doi: 10.1103/PhysRevLett.114.171103

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Research Areas & Interests:
Pedro Bicudo researches Quantum Chromodynamics, utilizing both computational techniques with lattice QCD and analytical continuum techniques. Notice lattice QCD is utilized in all developed countries and is very important to train young students in high performace computing. Moreover he transfers some of his quantum wave and computacional techniques to the development of technology for surfing. He has published 70 papers in top cited international scientific journals and has organized 10 international scientific conferences. He has supervised 3 post-docs, 3 PhD and 10 MSc thesis.

Selected References:
P. Bicudo and J. Ribeiro, “Current Quark Model in a p Wave Triplet Condensed Vacuum. 1. The Dynamical Breaking of Chiral Symmetry, Phys.Rev. D42 (1990) 1611-1624. doi: 10.1103/PhysRevD.42.1611

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Scientific Area: Plasma Physics, Lasers and Nuclear Fusion
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Research Areas & Interests:
João P. S. Bizarro authored or co-authored more than 80 papers in leading scientific journals covering a broad and eclectic spectrum of knowledge, from fundamental theoretical physics (quantum formalism, thermodynamics of irreversible processes, waves in plasmas) to engineering (RF antennas, system analysis and signal processing), and covering a wide variety of topics in the theory and modelling of magnetic fusion plasmas (non-inductive current drive, plasma transport and kinetics, Grad-Shafranov equilibria, time-frequency analysis of diagnostic signals, simulation of tokamak experiments). He acted as Guest Editor of a Special Issue of the IEEE Transactions on Plasma Science on Numerical Simulation of Plasmas (2010). He was responsible for the Theory and Modelling Group at IPFN (2008-12) and, within the European Fusion Programme, was a member both of the Fusion Physics Committee (FPC) (2000–02) and of the Scientific and Technological Advisory Committee (STAC) (2002–07). He was both a JNICT fellow (1988-90) and an Euratom fellow (1990-93), won an Honourable Mention in Physics of the UTL/Santander-Totta scientific prize (2012), and was awarded Outstanding Referee Status by Elseveier for the journal Annals of Physics (2014). He successfully supervised 3 PhD's and 1 MsC students.

Selected References:
P. Rodrigues and J. P. S. Bizarro, "Tokamak Equilibria With Toroidal-Current Reversal In The Plasma Core Consistent With Experimental Data", Physical Review Letters 99, 125001 1-4 (2007). doi: 10.1103/PhysRevLett.99.125001

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Research Areas & Interests:
Pedro Brogueira main scientific topics of research are scanning probe microscopy, semiconductor materials and devices, energy and particle physics detectors. His expertise covers vacuum technology; thin film deposition, PVD and CVD; optical, transport and structural thin film characterization; data acquisition systems design and implementation. He has been responsible for the Mechanics course for Physics Engineering first year students. He co-authored more than 140 scientific papers in international journals, 2 teaching books, 20 science videos broadcasted nationwide (one minute each), 3 science exhibitions and a science itinerancy project for the Ministry of Education and Science. He was coordinator of the Engineering Physics and of the Biomedical Engineering degrees of IST, member of the Pierre Auger Collaboration and he is presently the coordinator of the Scientific Area of Condensed Matter and Nanotechnology and President of the Physics Department and of the Center of Physics and Engineering of Advanced Materials (CeFEMA).

Selected References:
M. C. Faria, P. Brogueira, M. N. Pinho, “Sub-Micron Tailoring Of Bi-Soft Segment Asymmetric Polyurethane Membrane Surfaces With Enhanced Hemocompatibility Properties”, Coll. And Surf. B – Biointerfaces 86, 21 (2011). doi:10.1016/j.colsurfb.2011.03.021

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Research Areas & Interests:
Marco Cardoso has a Licenciatura in Engenharia Física Tecnologica from IST and a PhD in Physics from the same institution. He studies confinement and exotic hadrons using lattice QCD and quark models, both chiral and non-chiral. Also, he has developed some work on Superconductors.

Selected References:
M. Cardoso, G. Rupp, and E. van Beveren. "Unquenched Quark-Model Calculation Of X (3872) electromagnetic Decays". Eur. Phys. J. C 75.1 (2015). doi:10.1140/epjc/s10052-014-3254-z

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Research Areas & Interests:
Vitor Cardoso is Professor of Physics at IST, where he is head of the Gravity group at CENTRA. He is a Visiting Fellow at Perimeter Institute, an Outstanding Visiting Researcher at Rome "La Sapienza"' and an ERC St & Co Grant holder. He is mainly focused on strong-gravity problems, with implications for gravitational-wave physics, high-energy and particle physics. He is co-author of the book "Superradiance" (Springer-Verlag, 2015) and of over 150 scientific papers. In 2015, he was awarded the "Ordem de Sant'Iago da Espada" title, for scientific achievements, by the President of the Portuguese Republic.

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R. Brito, V. Cardoso and P. Pani. Superradiance, Lecture Notes in Physics (Springer - Verlag, 2015). eBook ISBN: 978-3-319-19000-6

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V. Cardoso, L. Gualtieri, C. Herdeiro and U. Sperhake, "Exploring New Physics Frontiers Through Numerical Relativity", Living Rev. Relativity 18, 1 (2015). doi: 10.12942/lrr-2015-1, 10.1007/lrr-2015-1

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Research Areas & Interests:
Bernardo Carvalho works on Fusion Plasma Technologies, mainly on Control and Data Acquisition Systems and High-Performance Digital Processing Hardware and Software. He is also developing the control system for the ESTHER shock Tube.

Selected References:
R. König, J. Baldzuhn, W. Biel, C. Biedermann, H. Bosch, S. Bozhenkov, T. Bräuer, B. B. de Carvalho et al. "The Set of Diagnostics for the First Operation Campaign of the Wendelstein 7-X Stellarator", Journal of Instrumentation (2015). doi: 10.1088/1748-0221/10/10/P10002

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Research Areas & Interests:
Gustavo Castelo-Branco works in Particle Physics Theory and he has 140 published papers with a total of 7487 citations as indicated in Spires. Some of his papers have great impact, for example a paper published in Physics Reports (2012) received 772 citations. He has been awarded various scientific prizes, including the von Humboldt Award and the Gulbenkian prize for Science. He has supervised more than 10 PhD thesis. He has been invited to give plenary sessions in many major international Conferences.

Selected References:
G. Castelo-Branco, P. Ferreira, L. Lavoura, M. Rebelo, M. Sher and J. P. Silva "Theory And Phenomenology Of Two-Higgs-Doublet Models". Physics Reports 516.1-2 (2012): 1-102. (Cited 772 times) doi: 10.1016/j.physrep.2012.02.002

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Research Areas & Interests:
Eduardo V. Castro has a background in Theoretical Condensed Matter Physics, with focus on phenomenological descriptions of two-dimensional systems. He then was a visiting post-doc at MPI-PKS in Dresden, and a Juan de la Cierva post-doc at ICMM- CSIC in Madrid. In 2011, he joined IST as an Assistant Professor. He is also an associate member at CSRC – Computational Science Research Center in Beijing, China since 2012. E. V. Castro has been contributing to the field of graphene physics since 2006, with a first, highly cited (>900 citations, Thomson Reuters; >1200 citations, Google Scholar) publication in 2007. Recently, he has also contributed to the field of non-trivial topological electronic systems, with emphasis in two-dimensional realizations. He is currently supervising 2 MSc students, 2 PhD students, and 2 Post-Docs. He is the author of 31 indexed scientific articles in excess of 2300 citations (Google Scholar; 1700 Thomson Reuters).

Selected References:
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PhD: Universidade de Lisboa, 2011.
Scientific Area: Particle Physics and Nuclear Physics
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Research Areas & Interests:
Ruben Conceição is a member of the Pierre Auger Observatory, an experiment dedicated to the study of Ultra High Energy Cosmic Rays. Besides participating in the data analysis he has published several works on the Extensive Air Shower phenomenology with particular focus on the study of hadronic interactions at energies above those reached by Man-made accelerators. He has published 66 paper and has a h-index of 31.

Selected References:
R. Conceição, J. Dias de Deus, and M. Pimenta, “Proton–Proton Cross-Sections: The Interplay Between Density And Radius”. Nuclear Physics A 888 (2012): 58-66. doi: 10.1016/j.nuclphysa.2012.02.019

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Research Areas & Interests:
R. Crespo works in reaction theory. In particular the development of reaction frameworks to study exotic nuclei. She works in collaboration with leading experimental facilities of Radioactive Ion Beams (RIB) such GSI/FAIR/Germany and RIKEN/Japan.

Selected References:
R. Crespo, A. Deltuva, and E. Cravo, "Rescattering Effects For The 12C (p,2 p)11B Reaction At 400 MeV/u", Phys. Rev. C 90.4 (2014). doi: 10.1103/PhysRevC.90.044606

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Scientific Area: Condensed Matter and Nanotechnology
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Research Areas & Interests:
Carlos R. Cruz is the Coordinator of the Complex Fluids NMR and Surfaces Group of CeFEMA (Center of Physics and Engineering of Advanced Materials). His research work is mainly focused on Liquid Crystals Experimental Physics with particular emphasis on NMR and X-ray diffraction studies. In recent years he has been team- leader in two European Projects on Liquid Crystal Dendrimers. He has published 36 papers in international journals and a book on NMR of Liquid Crystal Dendrimers. He was awarded the "Excellent Teacher" distinction at IST in 2014. He was vice- coordinator of the Technological Physical Engineering MSc course and member of the Pedagogical Council of IST from 2009 to 2011.

Selected References:
Carlos R. Cruz, João L. Figueirinhas, Pedro J. Sebastião, NMR of Liquid Crystal Dendrimers, (Pan Stanford Publishing, 2016). In press.

S. Polineni, J. L. Figueirinhas, C. Cruz, D. A. Wilson, G. H. Mehl, "Capacitance And Optical Studies Of Elastic And Dielectric Properties in an Organosiloxane Tetrapode Exhibiting a Nb Phase", J. Chem. Phys., 138, 124904-124904 (2013). doi: 10.1063/1.4795582

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Scientific Area: Particle Physics and Nuclear Physics
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Research Areas & Interests:
Alessandro de Angelis is a high-energy physicist and astrophysicist. Full Professor at the University of Udine and the IST of the University of Lisbon, he is currently Director of Research at INFN Padova and chairman of the collaboration board managing the MAGIC gamma-ray telescope at the Northern European Observatory, La Palma, Canary Islands. His main research interest is fundamental physics, especially astrophysics and elementary particle physics at accelerators. After graduating from Padova University, de Angelis was employed at CERN in the 1990s, and he later became a founding member of the collaboration board managing the NASA Fermi gamma-ray telescope. He has been a lecturer in electromagnetism and astroparticle physics in Italy and Portugal and Visiting Professor at the ICRR in Tokyo, the Max-Planck Institute in Munich, and the University of Paris VI.

Selected References:
A. De Angelis and M. Pimenta, "Introduction To Particle And Astroparticle Physics", Springer 2015. ISBN 978-88-470-2688-9

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Research Areas & Interests:
João Mendanha Dias research is focused on secondary radiation sources and optical diagnostics in laser-plasma interaction field. He has also devoted significant work to optical applications in medicine (eye optical modeling) and in industry (spectroscopy and laser metrology). His research methodology is based on experimental work and occasionally simulations and modeling. He has supervised 7 MSc and 2 PhD thesis. At the Physics Dept., he has been responsible for several teaching experimental physics laboratories in the Engineering Physics and other IST's Engineering courses and former vice-director of the Engineering Physics Integrated Master Course.

Selected References:
A. Boné, N. Lemos, G. Figueira and J. M. Dias, "Quantitative Shadowgraphy For Laser–Plasma Interactions", Journal of Physics D: Applied Physics 15, 49, (2016). doi: 10.1088/0022-3727/49/15/155204

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Scientific Area: Interdisciplinary Physics
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Research Areas & Interests:
Rui Dilão is Professor of Mathematical Physics and Dynamical Systems at Instituto Superior Técnico. He is author of more than 70 research publications, distributed among dynamical systems theory, chaos theory, celestial mechanics, ecological and economic modelling, mathematical biology, biophysics, morphogenesis and nonlinear reaction-diffusion equations. In 1999, together with two colleagues, he received the LabMed prize for original research work on laboratorial research medicine. He has supervised 4 PhD thesis, 33 students at the master level, and has served as advisor of 4 postdoc researchers. He coordinated and participated in 18 research projects. On a regular basis, he serves as referee for several academic journals, and served as member of the steering committees of 2 research programs of the European Science Foundation. He participated as principal investigator in one of the work packages of the project GENNETEC (2006-2009) supported by the European Commission.

Selected References:
J. Cascais, R. Dilão and A. Noronha da Costa, "Chaos and Reverse Bifurcations in a RCL circuit", Physics Letters A, 93 (1983) 213-216, doi: 10.1016/0375-9601 (83)90799-5

J. Sainhas and R. Dilão, "Wave Optics in Reaction-Diffusion Systems", Physical Review Letters, 80 (1998) 5216-5219, doi: 10.1103/PhysRevLett.80.5216

R. Dilão, "Anti-phase and In-phase Synchronization of Nonlinear Oscillators: The Huygens's Clocks System", Chaos, 19 (2009) 023118, doi: 10.1063/1.3139117

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Research Areas & Interests:
Fractional Brownian Motion in Polymers;
Stock Market geometry e portfolios;
Natural Language Processing.

Selected References:
W. Bock, J. B. Bornales, C. O. Cabahug, S. Eleutério, L. Streit, "Scaling Properties of Weakly Self-Avoiding Fractional Brownian Motion in One Dimension", Journal of Statistical Physics, Vol. 161, Issue 5 (2015) 1155–1162. doi:10.1007/s10955-015-1368-9

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E. Ranchhod and S.l Eleutério, "Finite-State Local Grammars for Disambiguating Conjunctions in Portuguese Proper Names", In Finite-State Methods and Natural Language Processing (Post-Proceedings of the 7th International Workshop on FSMNLP 2008), Frontiers in Artificial Intelligence and Applications, 191, pp. 62-71, IOS Press (2009). doi:10.3233/978-1-58603-975-2-62

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Research Areas & Interests:
Pietro Faccioli is ideator and leader of the most important measurements of quarkonium production being performed in the CMS experiment at the LHC. His studies triggered a change of paradigm in the way experiments measure quarkonium polarization, as testified by requests of other high-energy physics experiments (ATLAS, LHCb, ALICE, PHENIX, CDF, NA60, E866) concerning methods for accurate polarization analyses. At the same time he performs phenomenological studies on polarization measurements in general and on quarkonium data in particular. The studies have already lead to the solution of the decades-long "polarization puzzle" of quarkonium production and redefined/generalized the famous Lam-Tung relation for dilepton decay distributions.

Selected References:
P. Faccioli, C. Lourenco and J. Seixas, "Rotation-invariant Relations In Vector Meson Decays Into Fermion Pairs", Phys. Rev. Lett. 105, 061601 (2010). doi: 10.1103/PHYSREVLETT.105.061601

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P. Faccioli, C. Lourenco, J. Seixas and H.K. Woehri, "Towards The Experimental Clarification Of Quarkonium Polarization", Eur. Phys. J. C 69, 657 (2010). doi: 10.1140/epjc/s10052-010-1420-5

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Research Areas & Interests:
Marta Fajardo's research is carried at the Group for Lasers and Plasmas at IPFN. She studies novel X-ray sources, from plasma X-ray lasers to High Harmonic Generation and X-ray Free Electron Lasers, and their application in unprecedented spatial and temporal resolution. She is part of the Board of the Plasma Physics Division of the European Physical Society and Chair of the Beam Plasmas and Inertial Fusion Division of EPS-PPD. Her team is currently setting up the VOXEL X-ray metrology lab at IST.

Selected References:
G. Lambert, B. Vodungbo, J. Gautier, B. Mahieu, V. Malka, S. Sebban, P. Zeitoun, J. Luning, J. Perron, A. Andreev, S. Stremoukhov, F. Ardana-Lamas, A. Dax, C. P. Hauri, A. Sardinha and M. Fajardo, "Towards Enabling Femtosecond Helicity-Dependent Spectroscopy With High-Harmonic Sources", Nature Communications 6, 6167 (2015). doi: 10.1038/ncomms7167

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P. Zeitoun, M. Fajardo, G. Lambert, "X-RAY LASERS Coherent and Compact", Nature Photonics, Volume: 4 Issue: 11 Pages: 739-740 (2010). doi: 10.1038/nphoton.2010.257

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Research Areas & Interests:
Matter-antimatter asymmetry of the Universe, neutrino physics, early Universe cosmology, among others.

Selected References:
G.C. Branco, R. González Felipe, F.R. Joaquim, “Leptonic CP Violation”, Reviews of Modern Physics 84.2 (2012): 515-565. doi: 10.1103/RevModPhys.84.515

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G.C. Branco, R. González Felipe, F.R. Joaquim, M.N. Rebelo, “Leptogenesis, CP Violation And Neutrino Data: What Can We Learn?” Nuclear Physics B 640.1-2 (2002): 202-232. doi: 10.1016/S0550-3213(02)00478-9

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Scientific Area: Plasma Physics, Lasers and Nuclear Fusion
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Research Areas & Interests:
Horácio Fernandes is a researcher at IPFN, where he coordinates the activity on the tokamak ISTTOK and is the Experimental Physics group leader. In 1999 he created the e-lab, the first remote laboratory at IST and one of the few in the world for education purposes, with free access and hosting about 20 online experiments. His scientific interests cover fusion devices real-time operation and engineering. He also maintains regular participation in science outreach. He was appointed during six years member of the "Technical Advisor Panel" at F4E (the European Agency for ITER), had been a research coordinator in IAEA and served in several national and international boards of conferences and societies. He has authored more than 200 scientific works either in international journals or conference proceedings. He has supervised 14 MSc and 5 PhD students**.**

Selected References:
C. Hidalgo, C. Silva, M. A. Pedrosa, E. Sánchez, H. Fernandes, and C. A. F. Varandas, "Radial Structure of Reynolds Stress in the Plasma Boundary of Tokamak Plasmas", Phys. Rev. Lett. 83.11 (1999): 2203-2205. doi: 10.1103/PhysRevLett.83.2203

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Scientific Area: Particle Physics and Nuclear physics
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Research Areas & Interests:
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Structure and decay of nuclei at the extremes of stability.
Properties of nuclei relevant to the nucleosynthesis of the elements.
The Nuclear Equation of State.

Selected References:
E. Maglione, L. S. Ferreira, R.J. Liotta, “Nucleon Decay From Deformed Nuclei”, Phys. Rev. Lett. 81 (1998) 538-541. doi: 10.1103/PhysRevLett.81.538

E. Maglione, L. S. Ferreira, R.J. Liotta, “Proton Emission From Deformed Nuclei”, Phys. Rev. C59 (1999) R589-92. doi: 10.1103/PhysRevC.59.R589

L. S. Ferreira, E. Maglione, “Odd-Odd Deformed Proton Emitters”, Phys. Rev. Lett. 86 (2001) 1721-4. doi: 10.1103/PhysRevLett.86.1721

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Scientific Area: Plasma Physics, Lasers and Nuclear Fusion
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Research Areas & Interests:
Gonçalo Figueira is interested in exploring and developing the concepts and the technology for next-generation high power lasers and their applications. In particular, he investigates new nonlinear optical materials and amplification techniques at the Laboratory for Intense Lasers, a leading facility hosting the most powerful laser in the country. He is in charge of the courses "Basic Experimental Physics", "Quantum Optics and Lasers" and co-organizes the Physics Department Colloquia. He has supervised 14 MSc and 3 PhD thesis. Apart from research and teaching, Gonçalo is also strongly involved with science communication and outreach activities, targeted at different audiences.

Selected References:
T. Peña and G. Figueira (eds.), "Histórias da Física em Portugal no Século XX", Ed. Gradiva (2016), ISBN: 978-989-616-686-1

H. Pires, M. Galimberti, and G. Figueira, "Numerical Evaluation of Ultrabroadband Parametric Amplification in YCOB", J. Opt. Soc. Am. B 31, 2608-2614 (2014). doi: 10.1364/JOSAB.31.002608

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PhD: Kent State University, 1987.
Scientific Area: Condensed Matter and Nanotechnology
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Research Areas & Interests:
João L. Figueirinhas characterizes liquid crystalline materials with fundamental physics relevance and also technological potential for display applications. The experimental techniques used include nuclear magnetic resonance (nmr) spectroscopy of hydrogen and deuterium, rheo-nmr, electro-optical measurements and x-ray diffraction. He has published 76 articles in international journals and he has supervised and co-supervised 6 PhD thesis.

Selected References:
J. L. Figueirinhas et al., "Deuterium NMR Investigation Of The Biaxial Nematic Phase In An Organosiloxane Tetrapode". Phys. Rev. Lett. 94.10 (2005). doi:10.1103/PhysRevLett.94.107802

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Scientific Area: Interdisciplinary Physics
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Research Areas & Interests:
Geophysicist, specialized in seismic hazard assessment and volcanic hazard assessment.

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Selected References:
A. Domingues, G. Silveira, A. M. Ferreira, ..., J. F. B. D. Fonseca, "Ambient noise tomography of the East African Rift in Mozambique", Geophysical Journal International, 204 (3) p. 1565-1578. doi: 10.1093/gji/ggv538

C. Canora, S. Vilanova, G. Besana-Ostman, ..., J. F. B. D. Fonseca, "The Eastern Lower Tagus Valley Fault Zone in Central Portugal: Active Faulting in a Low-deformation Region Within a Major River Environment", Tectonophysics, 660, p. 117-131. doi: 10.1016/j.tecto.2015.08.026

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Research Areas & Interests:
Susana Cardoso de Freitas (born 1973) is a senior researcher at INESC-MN and the co-leader of the Magnetics & Spintronic sensors group. She is co-author of over 240 publications, 2 patents and advised 2 PhD and 29 master students. She has coordinated 4 national projects, managed the INESC-MN participation in 3 training networks (Marie-Curie and ITN), and has been involved in several EU projects related with sensors. She is the responsible for the services provided by INESC-MN to external partners (academia and industry). Her research interests include advanced thin film deposition, magnetoresistive sensors (materials and microfabrication), large area electronics, integrated micro and nanosystems, biochips and sensor applications.

Selected References:
A. Alfadhel, M. Khan, S. Cardoso, and J. Kosel, "Magnetic Tactile Sensor for Braille Reading", IEEE Sensors Journal (2016). doi: 10.1109/JSEN.2016.2558599

D. C. Leitao, A. V. Silva, E. Paz, R. Ferreira, S. Cardoso, and P. P. Freitas, "Magnetoresistive Nanosensors: Vontrolling Magnetism at the Nanoscale", Nanotechnology 27, 045501 (2015). doi:10.1088/0957-4484/27/4/045501

J. Amaral, J. Gaspar, V .Pinto, T. Costa, N. Sousa, S. Cardoso, and P. Freitas, "Measuring Brain Activity with Magnetoresistive Sensors Integrated in Micromachined Probe Needles" Applied Physics A, 111:pp.407–412 (2013). doi: 10.1007/s00339-013-7621-7

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Scientific Area: Particle Physics and Nuclear Physics
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Research Areas & Interests:
I am a researcher in high energy particle physics working in the CMS experiment at the CERN LHC, the highest energy collider ever built. In 2012 we discovered the Higgs boson, and are now searching for physics beyond the Standard Model (SM). The CMS experiment, a collaboration of some 3000 physicists from all over the globe, is working to understand these questions by observing the proton collisions produced by the LHC. My current work on the CMS experiment is on the search for physics beyond the SM.

Selected References:
S. Chatrchyan et al. [CMS Collaboration], "Observation of a New Boson at a Mass of 125 GeV with the CMS Experiment at the LHC", Phys. Lett. B 716, 30 (2012). doi:10.1016/j.physletb.2012.08.021. (6059 citations counted in INSPIRE as of 04 Jul 2016)

F. Abe et al. [CDF Collaboration], "Observation of Top Quark Production in $\bar{p}p$ Collisions" Phys. Rev. Lett. 74, 2626 (1995). doi:10.1103/PhysRevLett.74.2626 (2846 citations counted in INSPIRE as of 04 Jul 2016)

F. Abe et al. [CDF Collaboration], "Evidence for Top Quark Production in $\bar{p}p$ Collisions at $\sqrt{s} = 1.8$ TeV," Phys. Rev. D 50, 2966 (1994). doi:10.1103/PhysRevD.50.2966 (934 citations counted in INSPIRE as of 04 Jul 2016)

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Research Areas & Interests:
João Gaspar has a PhD in Materials Engineering from INESC MN and IST, focused on the fabrication and characterization of thin film silicon microelectromechanical systems (MEMS). He worked at IMTEK Freiburg from 2005 to 2011 first as a post-doc and then as a group leader/lecturer in MEMS materials and devices. He joined INL Braga in 2011, where is currently the head of the nano fabrication department. He has published 78 scientific articles and presented his work in 130 conferences in the areas of cleanroom fabrication, MEMS and NEMS, advanced micro- and nano machining technologies, and sensors.

Selected References:
M. Costa, J. Gaspar, R. Ferreira, E. Paz, H. Fonseca, M. Martins, S. Cardoso, and P. P. Freitas, "Integration Of Magnetoresistive Sensors With Atomic Force Microscopy Cantilevers For Scanning Magnetoresistance Microscopy Applications", IEEE Trans. Magnetics, vol. 51, no. 11, pp. 6503104, Nov. 2015. doi: 10.1109/TMAG.2015.2448612

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PhD: Instituto Superior Técnico, 2002.
Scientific Area: Particle Physics and Nuclear Physics
Current Position: Invited Assistant Professor

Research Areas & Interests:
Patrícia Gonçalves is a Researcher at LIP, Laboratório de Instrumentação e Física Experimental de Partículas, in Lisbon, Portugal, where she coordinates the activities related to Space applications, in the field of Space Radiation Environment and Effects. She is also with the Portuguese group participating in the Pierre Auger Observatory and she is a member of the Geant4 collaboration. Her Research interests include the Radiation Environment in Space and Effects, the development of energetic particle radiation detectors for future space missions, Ultra High Energy Cosmic Rays and simulation of the interaction of particles with matter. She is author and co-author of over 200 papers covering different issues including High-Energy Physics, Astroparticle Physics, radiation environment and radiation transport simulations. Among these, 28 had her most relevant contributions.

Selected References:
P. Gonçalves, A. Keating, A. Trindade, P. Rodrigues, M. Ferreira, P. Assis, M. Muschitiello, B. Nickson, C. Poivey, "Modeling The Response Of The ESAPMOS4 RADFETs For The ALPHASAT CTTB Experiment", IEEE - Trans. Nucl. Sci., Volume:61 , Issue: 3, pp1439, June 2014. doi: 10.1109/TNS.2014.2321477

P. Gonçalves, A. Keating, G. Reitz and D. Matthiä, "Overview Of Energetic Particle Hazards During Prospective Manned Missions To Mars", Susan McKenna-Lawlor, Planetary and Space Science 63–64 (2012) 123–132. doi: 10.1016/j.pss.2011.06.017

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PhD: Instituto Superior Técnico, 2003.
Scientific Area: Plasma Physics, Lasers and Nuclear Fusion
Current Position: Assistant Researcher with *Habilitação*

Research Areas & Interests:
Bruno Soares Gonçalves is a researcher at the Instituto de Plasmas e Fusão Nuclear since 1996, having as main research areas the physics of edge plasmas, development of diagnostics for plasma fusion and control and data acquisition. In February 2012, he was granted his Habilitation for Coordination of Science degree ("Habilitação para o Exercício de Funções de Coordenação Científica em Engenharia Física Tecnológica"). He is the President of Instituto de Plasmas e Fusão Nuclear (since May 2012) and Head of the Group of Engineering and Systems Integration (since 2013). Bruno Gonçalves was responsible for several international projects (with a total funding that exceeds 15 M€) and presently is responsible for 2 project for ITER diagnostics development and for the Portuguese Participation in the Fusion Programme (through the EURATOM co-funded action carried out by the consortium Eurofusion). He is the portuguese delegate to the ESFRI's Physical Sciences and Engineering Working Group (nominated by FCT, since 2014) and member of IST Scientific Council (since 2013). Bruno Soares Gonçalves is co-author of a chapter in a book, of eighty articles published in international peer-reviewed journals, fifty-seven articles published in conference proceedings.

Selected References:
B. Goncalves, C. Hidalgo, M. A. Pedrosa, et al., "Role Of Turbulence On Edge Momentum Redistribution In The TJ-II Stellarator", Phy. Rev. Lett. Volume: 96 Issue: 14 Published: 2006. doi: 10.1103/PhysRevLett.96.14500

C. Hidalgo, B. Goncalves, C. Silva, et al., "Experimental Investigation Of Dynamical Coupling Between Turbulent Transport And Parallel Flows In The JET Plasma-Boundary Region", Phy. Rev. Lett. Volu me: 91 Issue: 6 Published: 2003. doi: 10.1103/PhysRevLett.91.065001

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PhD: Universidade Técnica de Lisboa, 1998.
Scientific Area: Plasma Physics, Lasers and Nuclear Fusion
Current Position: Associate Professor with *Agregação*

Research Areas & Interests:
Vasco Guerra develops kinetic models to study non-equilibrium processes in low- temperature plasmas. He is currently very interested in understanding how to take advantage of the internal degrees of freedom of the CO2 molecule to promote its recycling. He has been responsible of the courses of Statistical Mechanics and Plasma Physics and Technology. He was awarded the William Crookes Prize in 2016, sponsored by the European Physical Society and the Institute of Physics, for the outstanding contribution to the modeling of molecular low-temperature plasmas**.**

Selected References:
C. D. Pintassilgo and V. Guerra, “On The Different Regimes Of Gas Heating In Air Plasmas”, Plasma Sources Sci. Technol. 24 (2015) 055009. doi:10.1088/0963-0252/24/5/055009

V. Guerra, D. Marinov, O. Guaitella and A. Rousseau, “NO Oxidation On Plasma Pretreated Pyrex: The Case For A Distribution Of Reactivity Of Adsorbed O Atoms”, J. Phys. D: Appl. Phys. 46 (2014) 224012. doi: 10.1088/0022-3727/47/22/224012

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PhD: Universidade Técnica de Lisboa, 2004.
Scientific Area: Particle Physics and Nuclear Physics
Current Position: Assistant Professor

Research Areas & Interests:
Filipe R. Joaquim is interested in studying new physics phenomena at the elementary particle level. His research has been focused on the theoretical construction of new theories to be tested at current particle physics and cosmological experiments, which aim at understanding the origins of our Universe. He has published several papers in international journals and awarded the "Excellent teacher" distinction for the courses of Complements of Quantum Mechanics and Introduction to Research.

Selected References:
J. A. Aguilar-Saavedra, F.R. Joaquim, "Closer Look At The Possible CMS Signal Of A New Gauge Boson", Phys. Rev. D 90.11 (2014). doi: 10.1103/PhysRevD.90.115010

G. C. Branco, R. Gonzalez Felipe, F. R. Joaquim, "Leptonic CP Violation", Reviews of Modern Physics 84.2 (2012): 515-565. doi: 10.1103/RevModPhys.84.515

F. R. Joaquim and A. Rossi, "Gauge And Yukawa Mediated Supersymmetry Breaking In The Triplet Seesaw Scenario", Phys.Rev.Lett. 97 (2006). doi: 10.1103/PhysRev-Lett.97.181801

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PhD: Universidade do Porto, 2010.
Scientific Area: Condensed Matter and Nanotechnology
Current Position: Invited Assistant Professor

Research Areas & Interests:
Diana Leitao graduated in Applied Physics by the University of Porto in 2005, followed by her PhD in Physics from the same institution in 2010. Her thesis entitled "Micro and Nano Patterned Magnetic Structures" was developed at IFIMUP (Porto, Portugal) in collaboration with ICMM (Madrid, Spain). In addition to the FCT-2005 PhD scholarship, she was also awarded funding to study abroad and present her work by Fundação Calouste Gulbenkian and and The IEEE Magnetics Society. Since 2011, she is a FCT post-doctoral researcher at INESC-MN, focusing on the nanofabrication of magnetoresistive devices.This work was awarded First Prize at Sensors Expo 2016. In October 2013, Diana joined the Physics Department at Instituto Superior Técnico as Invited Assistant Professor. She is a member of The IEEE Magnetics Society and a referee for several high-impact journals, being currently an advisory panel member for IOP - Journal of Physics D: Applied Physics.

Selected References:
D. C. Leitao, A. V. Silva, E. Paz, R. Ferreira, S. Cardoso, and P.P. Freitas, "Magnetoresistive Nanosensors: Controlling Magnetism At The Nanoscale", Nanotechnology 27 (2016) 045501, featured in IOP LabTalk doi: 10.1088/0957-4484/27/4/045501

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PhD: University of Cambridge, 1987.
Scientific Area: Astrophysics and Gravitation
Current Position: Full Professor

Research Areas & Interests:
José P. S. Lemos works on black holes and fundamental physics. He devises methods to calculate the black hole entropy and so to arrive at an understanding of what and where are the black hole degrees of freedom. Those are connected at a semiclassical level to a still elusive quantum gravity. He also works on astrophysical and cosmological problems. He has published more than 150 papers, has more than 4500 citations in Inspires, has supervised 9 PhD theses, 15 MSc theses, and 10 postdoctoral researchers. He is Professor Catedrático at the Physics Department of Instituto Superior Técnico, President of CENTRA (Centro Multidisciplinar de Astrofísica) and in the period 2013-2015 has been President of the Physics Department. He is the recipient of national and international prizes, and has been invited professor at the University of Paris, University of Columbia New York, Freie University of Berlin, Universities and Institutions in Rio de Janeiro and in São Paulo. He has lectured and has been invited to give main talks in several international schools and conferences.

Selected References:
José P. S. Lemos, Francisco J. Lopes, Masato Minamitsuji, and Jorge V. Rocha, "Thermodynamics Of Rotating Thin Shells In The BTZ Spacetime", Physical Review D 92, 064012 (2015), arXiv:1508.03642 [hep-th]. doi: 10.1103/PhysRevD.92.064012

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Alexander B. Balakin, José P. S. Lemos, and Alexei E. Zayats, "Magnetic Black Holes And Monopoles In A Nonminimal Einstein-Yang-Mills Theory With A Cosmological Constant: Exact Solutions", Phys. Rev. D 93, 084004 (2016), arXiv:1603.02676 [gr-qc]. doi: 10.1103/PhysRevD.93.084004

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Scientific Area: Astrophysics and Gravitation
Current Position: Assistant Professor with *Agregação*

Research Areas & Interests:
Ilidio Lopes works in theoretical astrophysics, cosmology and particle physics. Following his Ph.D. in the University of Paris, he was a researcher in the "Commissariat à l'énergie atomique et aux énergies alternatives" (France), and in the Universities of Cambridge and Oxford (United Kingdom). He published more than100 articles from which 75 are articles in high impact journals, with a small number of authors (one or two). In the last 5 years he published 8 letters. In the year 2012, with Prof. Sylvaine Turck-Chieze, he wrote a review article on the topic "dark matter and stars", as part of the highlights for the 28th IAU General Assembly (Beijing, China) by invitation of the IAU. He supervised two Ph.D. students, both of which won Ph.D. research awards from the Fundação Calouste Gulbenkian**.**

Selected References:
I. Lopes, J. Silk 2010, "Neutrino Spectroscopy Can Probe The Dark Matter Content In The Sun", Science, Volume 330, pp. 462 (article chosen for Science Express Highlights, Science, Volume 329, pp.1251). doi:10.1126/science.1196564

S. Turck-Chieze, R. A. Garcia, S. Couvidat, R. K. Ulrich, L. Bertello, F. Varadi, A. G. Kosovichev, A. H. Gabriel, G. Berthomieu, A. S. Brun, I. Lopes, P. Palle, J. Provost, J. M. Robillot, T. Roca Cortes, "Looking For Gravity-Mode Multiplets With The GOLF Experiment aboard SOHO", The Astrophysical Journal, Vol. 604, Issue 1, pp. 455-468. doi:10.1086/381743

S.Turck-Chieze and I. Lopes, 1993, "Toward A Unified Classical Model Of The Sun - On The Sensitivity Of Neutrinos And Helioseismology To The Microscopic Physics", The Astrophysical Journal, 408, 347-367. doi:10.1086/172592

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PhD: Universidade Técnica de Lisboa,1987.
Scientific Area: Plasma Physics, Lasers and Nuclear Fusion
Current Position: Associate Professor with *Agregação*

Research Areas & Interests:
Modelling of molecular low-temperature plasmas, such as the self-consistent kinetic modelling of N2, H2, O2, N2-H2, N2-O2, N2-CH4, and N2-Ar plasmas under discharge and post-discharge conditions, including the strong coupling between electron and vibrational kinetics, together with chemical and ion kinetics. Study of plasmas created under non-equilibrium conditions such as those occurred during the early stages of the descent of a spacecraft in a planetary atmosphere (Earth, Mars and Titan). Developing of kinetics and fluid models to take into account the energy transferred by a strong shockwave into the internal modes of molecules ultimately leading to strongly non-equilibrium dissociation and ionization reactions. Comparison with plasmas produced in a discharge. He has published 77 papers in international scientific journals and 3 books. He has supervised 3 PhD and 4 MSc thesis.

Selected References:
J. Loureiro, "Time-dependent Electron Kinetics in N2 And H2 for a Wide Range of the Field Frequency Including e-V Superelastic Collisions", Physical Review E, 47(2), 1993, 1262-1275. doi:10.1103/PhysRevE.47.1262

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J. Loureiro and J. Amorim, "Kinetics and Spectroscopy of Low Temperature Plasmas" (Springer: Graduate Texts in Physics, 2016), ISBN 978-3-319-09252-2

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PhD: Imperial College London, 2005.
Scientific Area: Plasma Physics, Lasers and Nuclear Fusion
Current Position: Invited Associate Professor

Research Areas & Interests:
Nuno Loureiro is a theoretical and computational plasma physicist working on magnetic confinement fusion and astrophysics. His main areas of investigation are magnetic reconnection – the explosive topological reconfiguration of the magnetic field in a plasma that lies at the heart of solar flares, amongst many other phenomena – and plasma turbulence. He is the 2015 recipient of the American Physical Society Thomas H. Stix Award for Outstanding Early Career Contributions to Plasma Physics Research.

Selected References:
N. F. Loureiro, A. A. Schekochihin and S. C. Cowley, "Instability of Current Sheets and Formation of Plasmoid Chains", Physics of Plasmas, 14, 100703. doi: 10.1063/1.2783986

K. M. Schoeffler, N. F. Loureiro, R. A. Fonseca, and L. O. Silva, "Magnetic-Field Generation and Amplification in an Expanding Plasma", Physical Review Letters 112, 175001. doi: 10.1103/PhysRevLett.112.175001

D. A. Uzdensky and N. F. Loureiro, "Magnetic Reconnection Onset via Disruption of a Forming Current Sheet by the Tearing Instability", Physical Review Letters 116, 105003. doi: 10.1103/PhysRevLett.116.105003

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PhD: Universidade de Lisboa, 2000.
Scientific Area: Plasma Physics, Lasers and Nuclear Fusion
Current Position: Assistant Professor

Research Areas & Interests:
I am responsible for teaching (Assistant Professor) on the Physics Department of the Instituto Superior Técnico experimental and theoretical physics on the subjects of Electromagnetism and Mechanics. As for research I work mainly on the developments of the heavy ion beam diagnostic for the tokamak ISTTOK. I am responsible for the activities on numerical modelling, design, upgrades and commissioning since 1992. I am supervising two PhD students in implementing new developments for the HIBD diagnostic system in order to measure density fluctuations to characterize MHD activity and turbulence and performing cross checks with Mirnov coils and Langmuir probes. Another development is the implementation of a new detection system in order to provide the simultaneous measurements of plasma potential, plasma poloidal magnetic field and plasma density radial profiles and their fluctuations up to 250 kHz based on a new concept of a cylindrical electrostatic energy analyzer.

Selected References:
A. Malaquias, R. B. Henriques and I. S. Nedzelsky, “Inversion Methods For The Measurements Of Mhd-Like Density Fluctuations By Heavy Ion Beam Diagnostic”, Journal of Instrumentation, Volume 10, September 2015. doi:10.1088/1748-0221/10/09/P09024

R. B. Henriques, A. Malaquias, I. S. Nedzelskiy, C. Silva, R. Coelho, H. Figueiredo, and H. Fernandes, “Radial Profile Measurements Of Plasma Pressure-Like Fluctuations With The Heavy Ion Beam Diagnostic On The Tokamak ISTTOK”, Review Of Scientific Instruments, 85.11 (2014): 11D848. doi: 10.1063/1.4891045

A. Malaquias, I. Nedzelsky, B. Goncalves, et al., “Comparative Study Design Of A Heavy Ion And Neutral Beam Diagnostic For The International Tokamak Experiment Reactor”, Review of Scientific Instruments 74.3 (2003): 1857. doi: 10.1063/1.1538507

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PhD: Instituto Superior Técnico, 1988.
Scientific Area: Condensed Matter and Nanotechnology
Current Position: Assistant Professor

Research Areas & Interests:
Study of thermophysical properties of nanomaterials at high temperatures. Properties measured are thermal diffusivity by laser flash technique and Cp by Differential scanning calorimetry. Collaboration in the area of photocapacitance. He has published 32 papers in international journals and is responsible by discipline “Laboratory of Workshop” since 1988. Co-oriented two PhD and three MSc thesis.

Selected References:
E. Tejado, P. Carvalho, A. Munoz, M. Dias, J. Correia, U. Mardolcar, and J. Pastor, “The Effects Of Tantalum Addition On The Microtexture And Mechanical Behaviour Of Tungsten For ITER Applications”, Journal of Nuclear Materials 467 (2015) 949-955. doi: 10.1016/j.jnucmat.2015.10.034

D. Nunes, V. Livramento, U. Mardolcar, J. B. Correia, P. A. Carvalho, “Tungsten-Nanodiamond Composite Powders Produced By Ball Milling”, Journal of Nuclear Materials 426 (2012) 115–119. doi:10.1016/j.jnucmat.2012.03.028

V. Livramento, D. Nunes, J. B. Correia, P. A. Carvalho, U. Mardolcar, R. Mateus, K. Hanada, N. Shohoji, H. Fernandes, C. Silva, E. Alves, “Tungsten-Microdiamond Composites For Plasma Facing Components”, Journal of Nuclear Materials 416 (2011), 45-48. doi: 10.1016/j.jnucmat.2011.02.031

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PhD: Instituto Superior Técnico, 1988.
Scientific Area: Condensed Matter and Nanotechnology
Current Position: Assistant Professor with *Agregação*

Research Areas & Interests:
A. M. Martins research activity is in the fields of Quantum Optics and Quantum Computation and Information with special emphasis in the characterisation of quantum correlations in the form of entanglement or such as quantum discord.

Selected References:
A. M. Martins, "Necessary And Sufficient Conditions For Local Unitary Equivalence Of Multiqubit States", Phys. Rev. A 91, 042308 (2015). doi: 10.1103/PhysRevA.91.042308

A. M. Martins, "Minimization of A Quantum Automaton: The Transducer", Phys. Rev. A 78, 062326 (2008). doi: 10.1103/PhysRevA.65.052114

Ana M. Martins, , "Proposed Demonstration Of The Einstein-Poldosky-Rosen Paradox Using Trapped Electrons", Phys. Rev. A 65, 052114 (2002). doi: 10.1103/PhysRevA.65.052114

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PhD: École Polytechnique Fédérale de Lausanne, 1984.
Scientific Area: Condensed Matter and Nanotechnology
Current Position: Full Professor

Research Areas & Interests:
José Luís Martins uses electronic structure theory to simulate the properties of materials. He has published 100 articles, some of which are highly cited, on methods of electronic structure theory, fullerenes, semiconductor alloys and clusters.

Selected References:
N. Troullier and J. L. Martins, “Efficient Pseudopotentials for Plane-Wave Calculations”, Phys. Rev. B 43, 1993 (1991). doi: 10.1103/PhysRevB.43.1993

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Current Position: Assistant Professor with *Agregação*

Research Areas & Interests:
Luis V. Melo works in different fields related to scanning probe microscopy (SPM), as AFM applied to Biology and to nanofabrication, as well as imaging in different fields of materials science. Work developed includes the study of cellular phenomena, as cilia growth in Tetrahymena and the host cell invasion by parasite Besnoitia, and also study of the behaviour of microtubules in large electromagnetic fields. He also co- developed a nanometre-sized pattern fabrication method using an AFM metal-coated tip. This technique was further expanded to the fabrication of metal/semiconductor junctions. Lately has also developed work on synchronization of oscillators. From 2006 to 2010 he was Advisor of the FCT for NanoTechnologies. He is also the national delegate to international bodies, including the EU High Level Group on Nanotechnologies and Advanced Materials, the EU JTI ECSEL, and the H2020 Nanoscience and Nanotechnology, Materials, Biotechnology and Production Technologies (NMBP) Program Committee. He was also vice-chair of the OECD Working Party on Nanotechnology until the end of its mandate (12/2014). From 2010 to 2011 he was Benjamin Meaker Visiting Professor of the IAS of the University of Bristol (UK). He is currently Vice-President of IST-ID and of the Physics Department of IST.

Selected References:
Y. Reis, H. Cortes, L. V. Melo, I. Fazendeiro, A. Leitao, H. Soares, "Microtubule Cytoskeleton Behavior In The Initial Steps Of Host Cell Invasion By Besnoitia Besnoiti". FEBS LETTERS 580 (19): 4673-4682 (2006). doi: 10.1016/j.febslet.2006.07.050

A. I. S. Neves, T. H. Bointon, L. V. Melo, S. Russo, I. De Schrijver, M. F. Craciun, H. Alves, "Transparent Conductive Graphene Textile Fibers", Scientific Reports 5, 9866 (2015). doi:10.1038/srep09866

H. M. Oliveira and L. V. Melo, "Huygens Synchronization Of Two Clocks". Scientific Reports 5, 11548 (2015). doi:10.1038/srep11548

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PhD: Instituto Superior Técnico, 2003.
Scientific Area: Interdisciplinary Physics
Current Position: Assistant Professor

Research Areas & Interests:
Filipe Mendes works on solar refrigeration and air-conditioning systems and developed several small power prototypes obtaining a patent on a new approach for this type of machine. More recently he has started working on new scientific topics which include concentrating solar thermal energy and photovoltaics. During the year of 2015 he was awarded the "Excellent Teacher" distinction at IST and has supervised 4 MSc thesis (concluded) and 2 PhD thesis (in progress). He also carried out activities of specialized training and promotion of science for teachers and students of primary and secondary schools of Mozambique and Cape Verde.

Selected References:
L. F. Mendes, M.Collares-Pereira, "Máquina De Absorção Com Sistema Inovador De Refinação De Vapor E Sistema De Controlo Do Modo De Funcionamento Para Funcionar Com Fontes De Energia De Baixa Temperatura", PT103112 (2005)

B. H. Gebreslassie, M. Medrano, F. Mendes, and D. Boer, "Optimum Heat Exchanger Area Estimation Using Coefficients Of Structural Bonds: Application To An Absorption Chiller", International Journal of Refrigeration 33.3 (2010): 529-537. doi:10.1016/j.ijrefrig.2009.12.004

A. M. Eiró, F. Mendes, G. Brites, P. Brogueira, "A Física No Dia-A-Dia Na Escola", Ministério da Educação e Ciência, Programa "O Mundo na Escola", 2014, 160 pgs, ISBN 978-972-95047-5-4

Manuela Mendes

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PhD: Université Paris VII, 1989.
Scientific Area: Interdisciplinary Physics
Current Position: Assistant Professor

Research Areas & Interests:
Manuela Mendes has been developing 3D imaging algorithms, in order to obtain a seismic image for the near-surface to assist geotechnical and environmental works.

Selected References:
W. B. Beydoun and M. Mendes. "Elastic Ray-Born L2 -Migration/Inversion". Geophysical Journal International 97.1 (1989):151-160. doi: 10.1111/j.1365-246X.1989.tb00490.x

M. Mendes, "A Hybrid Fast Algorithm For First Arrivals Tomography", Geophysical Prospecting Geophysical Prospecting 57.5 (2009): 803-809. doi: 10.1111/j.1365-2478.2008.00755.x

E. Martinho, A. Dionísio, F. Almeida, M. Mendes, C. Grangeia, "Integrated Geophysical Approach For Stone Decay Diagnosis In Cultural Heritage", Construction and Building Materials 52 (2014): 345-352. doi:10.1016/j.conbuildmat.2013.11.047

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PhD: Moscow State University, 1988.
Scientific Area: Astrophysics and Gravitation
Current Position: Associate Professor

Research Areas & Interests:
Ana Mourão has been participating in several international efforts related to the use of supernovae to understand dark energy (DE) and the accelerated expansion of the Universe. However the constrains on the nature of the DE from supernova can only be greatly improved with a much better control of systematics, such as extinction in host galaxies, environment or evolutionary effects, host galaxy properties. She is now a member of CALIFA - Calar Alto Legacy Integral Field Area Survey and she studies supernova host galaxies using wide field integral spectroscopy. Ana Mourão is responsible for the DEMO-Demonstrations laboratory. The aim of this Laboratory is to provide experimental support for the lecture courses in physics.

She was awarded with the diploma “Excellency in teaching 2014/2015”.

Selected References:
L. Galbany, V. Stanishev, A. M. Mourão, M. Rodrigues et al. The CALIFA Collaboration, “Nearby Supernova Host Galaxies From The CALIFA Survey: II. SN Environmental Metallicity”, Astronomy & Astrophysics, 2016, Volume 591, id. A48, 24pp. doi: 10.1051/0004-6361/201528045

P. Astier, J. Guy, N. Regnault, R. Pain, ..., A. Mourao et al. The Supernova Legacy Survey team, “The Supernova Legacy Survey: Measurement of Omega_M, Omega_Lambda And w From The First Year Data Set”, Astronomy and Astrophysics, 2006, Volume 447, pp.31-48 (TOP CITE 1000+ in SPIRES). doi: 10.1051/0004-6361:20054185

V. Arsenijevic, S. Fabbro, A.M. Mourão, A. Rica da Silva, “Diversity Of Supernovae Ia Determined Using Equivalent Widths Of Si II 4000”, Astronomy and Astrophysics, 2008, Volume 492, Issue 2, pp.535-544 doi: 10.1051/0004-6361:200810675

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Current Position: Associate Professor with *Agregação*

Research Areas & Interests:
Teresa Peña works in Nuclear and Hadron Physics. She mentors a group addressing challenging questions on properties of matter, important for progress in fields such as astrophysics and cosmology, as well as for technological applications, e.g., in medical imaging and radiation therapy, energy storage and production, and environmental issues. She wrote "Nucleus: the heart of matter", translated into 6 european languages and Korean, and authored more than 100 papers. She was awarded the Ohio University Glidden Visiting Professorship Award, for "distinguished individuals who have attained wide recognition based upon artistic, engineering, historical, literary, or scientific achievement." She supervised 4 post-docs, 3 PhD students, several master's dissertations. Important open questions addressed by her research are: What does the emmissivity of matter under extreme conditions tell us about the workings of the universe? What is the origin of the proton magnetic properties?

Selected References:
G. Ramalho. M. T. Peña, Janus Weil, H. van Hees, U. Mosel, "Role Of The Pion Electromagnetic Form Factor In The Δ(1232) → γ*N Timelike Transition", Phys. Rev. D93 (2016) no.3, 033004. doi: 10.1103/PhysRevD.93.033004

L. E. Marcucci, F. Gross, M. T. Peña, M. Piarulli, R. Schiavilla, I. Sick, A. Stadler, J. W. V. Orden, and M. Viviani, "Electromagnetic Structure Of Few-Nucleon Ground States", J.Phys. G43 (2016) 023002. doi: 10.1088/0954-3899/43/2/023002

E. P. Biernat, F. Gross, M. T. Peña, and A. Stadler, "Confinement, Quark Mass Functions, And Spontaneous Chiral Symmetry Breaking In Minkowski Space", Phys.Rev. D89 (2014) no.1, 016005. doi: 10.1103/PhysRevD.89.016005

Mário Pimenta

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PhD: Instituto Superior Técnico, 1986.
Scientific Area: Particle Physics and Nuclear Physics
Current Position: Full Professor

Research Areas & Interests:
Particle and Astroparticle Physics, in particular with Ultra High Energy Cosmic Rays and very High Energy Gamma Rays. Experimental High Energy Physics. Searches for New Physics. Hadronic Interactions. Radiation environment in the Heliosphere. Radiation effects on electronic components. Radiation monitors for space missions. Photosensors. Since 1989 Principal Investigator of more than 30 projects of relevant national interest financed by the Portuguese Science funding agencies in the framework of Portuguese participation at CERN and at ESA and in cosmic rays experiments. Supervisor of twelve PhD theses and several master theses. Co-author of the books “Introdução à Física” and “Introduction to Particle and Astroparticle Physics”, author and co-author of more than 400 scientific articles.

Selected References:
A. De Angelis, M. Pimenta: “Introduction to Particle and Astroparticle Physics”, Undergraduate Lecture Notes in Physics, Springer. ISBN: 978-88-470- 2687-2 (Print) 978-88-470-2688-9 (Online)

Co-author of a Physics textbook for undergraduates - “Introdução à Física” J.Dias de Deus, M. Pimenta, A. Noronha, T. Penha, P. Brogueira. 1st Edition, McGrawHill, 1992, 2nd Edition, McGrawHill, 2000, 3rd Edition, Escolar Editora, 2014. Spanish edition, McGrawHill, 2001. ISBN: 9789725924402

“Depth of Maximum of Air-shower Profiles at the Auger Observatory. I. Measurements at Energies above 10^17.8 eV”, Physical Review D 90, 122005 (2014), doi: 10.1103/PhysRevD.90.122005

Teresa Pinheiro

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PhD: Universidade de Lisboa, 1995.
Scientific Area: Interdisciplinary Physics
Current Position: Invited Assistant Professor

Research Areas & Interests:
Teresa Pinheiro was involved in the early developments of nuclear microscopy, at the international level, bridging the gap between Biology, Biomedicine and Accelerator Physics. Her main research activities are centered on the interaction of natural occurring and engineered nanoparticles with biological systems. This includes nanoparticle characterization and study of their mode of action and effects, by using a collection of techniques from physics to molecular biology, including bioimaging. She has more than 100 publications in international journals and book chapters. She supervised more than 20 MSc and 4 PhD in different scientific areas, such as Physics, Biology and Biomedicine.

Selected References:
T. Pinheiro, S.M. Almeida, P. Félix, C. Franco, S.M. Garcia, C. Lopes, A. Bugalho de Almeida, "Air Quality in Metal Industries: Exhaled Breath Condensate, a Tool for Noninvasive Evaluation of Air Pollution Exposure", The Quality of Air, Vol 73. Comprehensive Analytical Chemistry. Elsevier, 2016 (in press) ISSN 0166-526X. Doi: 10.1016/bs.coac.2016.03.014.

B. Gulson, M. J. McCall, D. M. Bowman, T. Pinheiro, "A Review of Critical Factors for Assessing the Dermal Absorption of Metal Oxide Nanoparticles from Sunscreens Applied to Humans, and a Research Strategy to Address Current Deficiencies", Archives of Toxicology, 2015; Nov;89(11):1909-30. Doi: 10.1007/s00204-015-1564-z

R. M. Godinho, M. T. Cabrita, L. C. Alves, T. Pinheiro. "Imaging of Intracellular Metal Partitioning in Marine Diatoms Exposed to Metal Pollution: Consequences to Cellular Toxicity and Metal Fate in the Environment", Metallomics 2014; 6(9)1626-31. doi:10.1039/c4mt00105b

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PhD: Universidade de Lisboa,1993.
Scientific Area: Interdisciplinary Physics
Current Position: Assistant Professor with *Agregação*

Research Areas & Interests:
Mário J. Pinheiro has been working in plasma and electromagnetic propulsion (EHD and DBD), the puzzle of the flyby anomaly of spacecrafts, working out a modified version of dynamics, in a transdisciplinary perspective. He has published more than 50 papers in referred journals and was awarded the "Excellent Teacher" distinction at IST in 2015. He supervised one MSc and 2 PhD Thesis.

Selected References:
M. J. Pinheiro, "Some Effects of Topological Torsion Currents on Spacecraft Dynamics and the Flyby Anomaly", MNRAS, 460(3) 2016. doi: 10.1093/mnras/stw15812

M. J. Pinheiro, "A Variational Method in Out-of-Equilibrium Physical Systems", Scientific Reports 3, Article number: 3454 (2013). doi:10.1038/srep03454

T. Musha, M. J. Pinheiro and T. Valone, "Gravitoelectromagnetic Theories and Their Applications to Advanced Science and Technology". ISBN: 978-1-62808-210-4

Amilcar Praxedes

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PhD: Instituto Superior Técnico, 1986.
Scientific Area: Condensed Matter and Nanotechnology
Current Position: Assistant Professor

Research Areas & Interests:
Amilcar Praxedes studies fast laser beam interactions with nanometric films deposited in metallic substrates, thin films and nanostructures in order to model the phenomenon. In particular, he uses plasmonic concepts to interpret experimental data. He has published 12 papers in international journals, published 26 papers in international conferences and was awarded the "Excellent Teacher" distinction at IST in 2015 for Electromagnetism and Optics (MEAmbi+LEMat+MEBiol+MEQuim).

Selected References:
E. E. B. Cowan, M. Fluendy, A. Moutinho, and A. Praxedes, "Non-adiabatic Processes in Alkali Metal-alkyl Halide Molecule Collisions. The Electron Harpoon" Molecular Physics, 52 -5 (1984), pag. 1125-1143. doi: 10.1080/00268978400101831

A. J. F. Praxedes and J.R. Naegele. "O2 Adsorption on UNi5 Studied by Ion Scattering Spectroscopy and UV Photoelectron Spectroscopy", Surface Science, 251/252 (1991) pag. 916-920 doi:10.1016/0039-6028(91)91124-G

J. A. C. Cabral, C. A. F. Varandas, A. Malaquias, A. Praxedes, et al., "Analysis of the IST-TOK Plasma Density Profile Evolution in Sawtooth Discharges by Heavy Ion Beam Probe" Plasma Physics and Controlled Fusion, 38(1996)pag.31-70, doi: 10.1088/0741-3335/38/1/002

Sérgio Ramos

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PhD: Université de Paris XI,1986.
Scientific Area: Particle Physics and Nuclear Physics
Current Position: Assistant Professor with *Agregação*

Research Areas & Interests:
Structure of matter, in the COMPASS experiment at CERN (and previously in the NA51 expt. at CERN): gluon polarisation; quark helicity and transverse distributions; transverse momentum dependent parton distribution functions. Heavy ion collisions, in the HADES experiment at GSI (and previously in the NA38 and NA50 expts. at CERN): properties of matter at high density; dielectron and strange particle detection.

Co-responsible for the LIP portuguese group of the experiment COMPASS at CERN, annual Projects financed by FCT (2002 - ...); Co-responsible for the LIP portuguese group of the NA50 experiment at CERN, annual Projects financed by FCT (1990 - 2004); Co-responsible for the LIP portuguese group of the experiment NA51 at CERN (1992 - 1993); Co-responsible for the LIP portuguese group of the NA38 experiment at CERN, annual Projects financed by FCT (1986 - 1992).

150 Publications in International Journals with Peer Review, from which 30 Publications have more than 100 citations, in accordance to inSPIRE; Supervision of several PhD Theses, and several Pre-Bologna and Bologna Master Theses.

Selected References:
"The Deuteron Spin-dependent Structure Function g1(d) and its First Moment", Physics Letters B647 (2007) 8. 300 citations, experiment COMPASS. doi:10.1016/j.physletb.2006.12.076

"Evidence for Deconfinement of Quarks and Gluons from the J/Psi Suppression Pattern Measured in Pb-Pb Collisions at the CERN - SPS", Physics Letters B477 (2000) 28. 415 citations, experiment NA50. doi:10.1016/S0370-2693(00)00237-9

"Study of the Isospin Symmetry Breaking in the Light Quark Sea of the Nucleon from the Drell-Yan Process", Physics Letters B332 (1994) 244. 365 citations, experiment NA51. doi:10.1016/0370-2693(94)90884-2

M. N. Rebelo

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PhD: Universidade Técnica de Lisboa, 1989
Scientific Area: Particle Physics and Nuclear Physics
Current Position: Invited Associate Professor

Research Areas & Interests:
Most of my work has been done in various phenomenological aspects of unified electroweak interactions, with particular emphasis on CP violation, Flavour Physics and Higgs Physics. I am specially interested in models with an extended scalar sector and the implications for Flavour Physics. I am also very interested in the question of the origin of fermion masses and mixing, both in the quark and leptonic sectors, in the framework of the Standard Model and beyond the SM as well as in the origin of CP violation. My work is closely related to LHC physics. More than 40 papers in journals with referee. More than 3300 citations in Inspire, h index = 29.

Selected References:
G. C. Branco, P. M. Ferreira, L. Lavoura, M. N. Rebelo, M. Sher and J. P. Silva, "Theory And Phenomenology Of Two-Higgs-Doublet Models". Physics Reports 516.1-2 (2012): 1-102 (790 citations counted in INSPIRE as of 15 Sep 2016). doi: 10.1016/j.physrep.2012.02.002

M. N. Rebelo, "Leptogenesis Without CP Violation At Low Energies". Physical Review D 67.1 (2003): n. pag. (68 citations counted in INSPIRE as of 15 Sep 2016). doi: 10.1103/PhysRevD.67.013008

G. C. Branco, M. N. Rebelo and J. I. Silva-Marcos, "Degenerate And Quasidegenerate Majorana Neutrinos". Phys. Rev. Lett. 82.4 (1999): 683-686. (103 citations counted in INSPIRE as of 15 Sep 2016). doi: 10.1103/PhysRevLett.82.683

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PhD: LPTMC, Université Pierre et Marie Curie, Paris, 2008.
Scientific Area: Condensed Matter and Nanotechnology
Current Position: Invited Assistant Professor

Research Areas & Interests:
I am a researcher at the Center of Physics and Engineering of Advanced Materials (CeFEMA), Lisbon and an invited Professor at the Physics Department of Instituto Superior Técnico (IST). Previously, I was a research fellow at RQC, Moscow (2014-2015), a postdoctoral fellow at CFIF, IST, Lisbon (2013-2014, 2008-2011), at the MPI- PKS, Dresden (2011-2013), and at MIT-CMT, Cambridge USA (2009 - 2010). I obtained my PhD in 2008 from UPMC, Paris-VI. My research has been developed within the fields of Condensed Matter and Quantum Information. My current interests focus on aspects of open quantum systems driven away from equilibrium. This research line provides a route to novel phases of matter with exotic properties that are impossible at equilibrium and have potential applications in thermoelectrics, electronic and sensing devices and quantum information processing. To date, I have had 31 publications in international refereed journals, from which 7 PRL, 6 PRB, 4 PRA, 2 PRE, 1 EPL, 2 NJP, as well as three book chapters.

Selected References:
P. Ribeiro and V. R. Vieira; "Non-Markovian Effects in Electronic and Spin Transport", Phys. Rev. B92, 100302 (R), 1 September 2015. doi: 10.1103/PhysRevB.92.100302

P. Ribeiro, F. Zamani, and S. Kirchner, "Steady-State Dynamics and Effective Temperature for a Model of Quantum Criticality in an Open System", Phys. Rev. Lett. 115, 220602, 25 November 2015. doi: 10.1103/PhysRevLett.115.220602

Y. E. Shchadilova, P. Ribeiro, and M. Haque, "Quantum Quenches and Work Distributions in Ultralow-Density Systems", Phys. Rev. Lett. 112, 070601, 19 February 2014. doi: 10.1103/PhysRevLett.112.070601

Jorge C. Romão

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PhD: University of Chicago,1979.
Scientific Area: Particle Physics and Nuclear Physics
Current Position: Full Professor

Research Areas & Interests:
Jorge C. Romão studies weak interactions. This includes looking at precision tests of the Standard Model as well as studying its extensions. He is a specialist in supersymmetric theories both with and without R-parity, where he has done extensive work in connection with neutrino physics. More recently his interests have moved focus into models with several Higgs doublets, both CP conserving or CP violating. He has published 89 papers in top international journals and two books. He has been the Portuguese coordinator for 4 European Union Marie Curie Training Networks. He has supervised or co-supervised 8 PhD thesis.

Selected References:
M. Hirsch, M. A. Diaz, W. Porod, J. C. Romao and J. W. F. Valle, "Neutrino Masses and Mixings from Supersymmetry with Bilinear R Parity Violation: A Theory for Solar and Atmospheric Neutrino Oscillations", Phys.Rev. D62 (2000) 113008, doi:10.1103/PhysRevD.65.119901

D. Fontes, J. C. Romao, R. Santos and J. P. Silva, "Large Pseudoscalar Yukawa Couplings in the Complex 2HDM", JHEP06 (2015) 060. doi: 10.1007/JHEP 06(2015)060

J. W. F. Valle and J. C. Romao, "Neutrinos in High Energy and Astroparticle Physics" (Wiley-VCH, 2015). ISBN: 978-3-527-41197-9

Pedro Sacramento

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Scientific Area: Condensed Matter and Nanotechnology
Current Position: Associate Professor with *Agregação*

Research Areas & Interests:
Pedro D. Sacramento works in theoretical condensed matter physics with emphasis on strongly correlated systems, superconductivity and topological insulators and superconductors. He has around 110 publications in international journals and books. These works are the result of collaborations with colleagues in different universities and institutes, postdoctoral collaborators, doctoral and master degree students. The work was mainly carried out at CFMC, CFIF and CeFEMA. He is co-author of a textbook on Quantum Mechanics by IST Press and has lectured courses including Thermodynamics, Statistical Mechanics, Solid State Physics, Condensed Matter Physics, Topics in Condensed Matter Physics, Phase Transitions and Advanced Condensed Matter Physics in addition to Quantum Mechanics.

Selected References:
P. Schlottmann and P. D. Sacramento, "Multichannel Kondo Problem and Some Applications", Advances in Physics 42, 641(1993). doi: 10.1080/00018 739300101534

Z. Tesanovic and P. D. Sacramento, "Landau-levels and Quasiparticle Spectrum of Extreme Type-II Superconductors", Physical Review Letters 80, 1521 (1998). doi: 10.1103/PhysRevLett.80.1521

N. Paunkovic, P. D. Sacramento, P. Nogueira, V. R. Vieira and V. K. Dugaev, "Fidelity Between Partial States as Signature of Quantum Phase Transitions", Physical Review A 77, 052302 (2008). doi: 10.1103/PhysRevA.77.052302

Reinhard Schwarz

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PhD: Université de Neuchâtel,1982.
Scientific Area: Condensed Matter and Nanotechnology
Current Position: Associate Professor with *Agregação*

Research Areas & Interests:
Reinhard Schwarz studied Physics and Mathematics at the University of Stuttgart, Germany, and did a Ph.D. in High Energy Physics at the University of Neuchâtel, Switzerland. After a postdoc at Princeton University, where he worked on amorphous silicon based solar cells, he started his own research group at the Technical University of München, Germany. He focused on new deposition methods and transport studies in amorphous superlattices. He is coauthor of some 250 publications in refereed journals and co-inventor of a cyclic chemical vapor deposition method for silicon and carbon based thin films. Currently, he is an associate professor at the Physics Department of Instituto Superior Técnico, Lisbon, Portugal, with research on recombination and transport in wide-band gap semiconductors and lead-free ferroelectrics prepared by pulsed laser deposition.

Selected References:
Q. Gu, E.A. Schiff, S. Grebner, F. Wang, and R. Schwarz, "Non-gaussian Transport Measurements and the Einstein Relation in Amorphous Silicon", Phys. Rev. Lett. 76 (1996) p. 3196. doi: 10.1103/PhysRevLett.76.3196

M. Niehus, P. Sanguino, R. Schwarz, T. Monteiro, M.J. Soares, E. Pereira, M. Kunst, and S. Koynov, "Low Temperature Photoluminescence, Transient Photoconductivity and Microwave Reflection for Optical Properties and Transport in PLD-GaN", phys. Stat. sol. (c) 0 (2002) 386. doi: 10.1002/pssc.200390069

R. Schwarz, L. Santos, R. Ayouchi, S. Bhattacharyya, U. Mardolcar, M. Leal, A. Kholkin, "Optical Properties of Lead-free NKN Films from Transmission and Spectral Ellipsometry", Ferroelectrics 446 (2013) 118. doi: 10.1080/00150193.2013.821018

Pedro J. Sebastião

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PhD: Universidade Técnica de Lisboa, 1993.
Scientific Area: Condensed Matter and Nanotechnology
Current Position: Associate Professor with *Agregação*

Research Areas & Interests:
Pedro J. Sebastião works in condensed matter physics with emphasis on molecular dynamics studies by NMR relaxation. In particular he has investigated the molecular dynamics in a large number of mesophases both thermotropic and lyotropic liquid crystals and more recently in ionic liquids. He works also in the development of new fast Field Cylinh NMR technology. He has published more than 70 papers in international journals and was awarded the "Excellent Teacher" distinction at IST in2013, 2014, and 2015. He has supervised or co-supervised 6 PhD and 7 MSc thesis.

Selected References:
C. I. Daniel, F. V. Chávez, C. A. M. Portugal, J. G. Crespo, and P. J. Sebastião, "1H NMR Relaxation Study of a Magnetic Ionic Liquid as a Potential Contrast Agent", The Journal of Physical Chemistry B 119(35) (2015), 11740–11747. doi:10. 1021/ acs.jpcb.5b04772.

A. Ferraz, J. Zhang, P. J. Sebastião, A. C. Ribeiro, and R. Y. Dong, "Proton and Deuterium Nuclear Spin Relaxation Study of the SmA and SmC* Phases of BP-8Cl-d(17): a Self-consistent Analysis", Magnetic Resonance In Chemistry 52(10) (Oct. 2014), 546–555. doi: 10.1002/ mrc.4107.

A. Gradišek, T. Apih, V. Domenici, V. Novotna, and P. J. Sebastião. "Molecular Dynamics in a Blue Phase Liquid Crystal: a H-1 Fast Field-cycling NMR Relaxometry study", Soft Matter 9(45) (2013), 10746–10753. doi: 10.1039/c3sm51625c

João Seixas

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PhD: Université Lyon I (Claude Bernard),1986.
Scientific Area: Particle Physics and Nuclear Physics
Current Position: Associate Professor with *Agregação*

Research Areas & Interests:
I study strong interactions, namely hard probes such as quarkonia in high energy heavy ion and proton-proton collisions at the Large Hadron Collider at CERN. Team leader in NA60 and CMS. Developed with Pietro Faccioli the technique for measuring vector particle polarization, a very important tool to study strong interactions which is being used by all high energy physics experiments. I also study the application of renewable energies in urban environments. Supervised 8 PhD students

Selected References:
"First Measurement of the rho Spectral Function in High-energy Nuclear Collisions", Phys. Rev. Lett. 96.16 (2006). doi: 10.1103/PhysRevLett.96.162302

P. Faccioli, C. Lourenço, J. Seixas, and H. K. Wöhri, "Towards the Experimental Clarification of Quarkonium Polarization", Eur. Phys. J. C 69.3-4 (2010): 657-673. doi: 10.1140/epjc/s10052-010-1420-5

F. Pietro, C. Lourenço, and J. Seixas, "Rotation-Invariant Relations in Vector Meson Decays into Fermion Pairs", doi: 10.1103/PhysRevLett.105.061601

Amaro Rica da Silva

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PhD: University of Florida,1989.
Scientific Area: Astrophysics and Gravitation
Current Position: Assistant Professor

Research Areas & Interests:
Amaro Rica da Silva explores new analysis and representation methods for astrophysical signals, advanced computational algorithms for the study of complex systems equations and dynamical simulation and prediction.

Selected References:
A. R. da Silva, J. P. S. Lemos. “Binary Collisions And The Slingshot Effect”. Celestial Mechanics and Dynamical Astronomy 100.3 (2008): 191-208. doi: 10.1007/s10569-007-9114-5

P. Jorge, A. R. da Silva, and I. Lopes. “Pulsating Spectrum Of Subdwarf Star PG 1605+072: Comparative Time Frequency Analysis Via Wavelet Packet And Local Sine Packet Transforms Of An Interrupted Light Curve”. Astrophysical Journal 647.1 (2006): 564-572. doi: 10.1086/504461

“6Th International Conference On Squeezed States And Uncertainty Relations May 24–29 1999, Naples, Italy”. J Russ Laser Res 19.6 (1999):505-512. doi: 10.1007/BF02559660

Carlos Garcia Silva

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PhD: Universidade de Lisboa, 2000.
Scientific Area: Plasma Physics, Lasers and Nuclear Fusion
Current Position: Assistant Professor with *Agregação*

Research Areas & Interests:
Carlos Garcia Silva is Assistant Researcher at IPFN. He is Deputy Leader of the Experimental Physics Group and tokamak ISTTOK, being responsible for the areas of diagnostics and physics. Carlos Garcia Silva has coordinated several European tasks and was scientific coordinator of experiments on different European fusion devices. He contributes to the support of the Master and PhD programmes at IST and is responsible for the Master course on Diagnostic Techniques and the PhD course on Methodologies and Techniques. He is also member of the Governing Board of the APPLAuSE PhD programme. Carlos Garcia Silva participates actively in the IPFN and Eurofusion administration. He is member of the Eurofusion Science and Technology Advisory Committee and was recently elected Boarder member of the EPS Plasma Physics Division. Carlos Garcia Silva is co-author of more than 140 publications in international scientific journals with referee.

Selected References:
C. Silva, J. Adamek, H. Fernandes and H Figueiredo, "Comparison of Fluctuations Properties Measured by Langmuir and Ball-pen Probes in the ISTTOK Boundary Plasma", Plasma Phys. Control. Fusion 57 (2015) 025003. doi:10.1088/0741-3335/57/2/025003

C. Silva, G. Arnoux, S. Devaux, D. Frigione, M. Groth, J. Horacek, P.J. Lomas, S. Marsen, G. Matthews, L. Meneses, R. A. Pitts, "Characterization of Scrape-off Layer Transport in JET Limiter Plasmas", Nucl. Fusion 54 (2014) 083022. doi: 10.1088/0029-5515/54/8/083022

C. Silva, G. Arnoux, M. Groth, C. Hidalgo, S. Marsen, "Observation of Geodesic Acoustic Modes in the JET Edge plasma", Plasma Phys. Control. Fusion 55 (2013) 025001. doi:10.1088/0741-3335/55/2/025001

João P. Silva

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PhD: Carnegie Mellon University,1994.
Scientific Area: Particle Physics and Nuclear Physics
Current Position: Associate Professor with *Agregação*

Research Areas & Interests:
I am interested in models and signals of new physics, including neutrinos, CP violation, and especially signs of more than one Higgs at the Large Hadron Collider, at CERN.

Selected References:
G.C. Branco, P. M. Ferreira, L. Lavoura, M. N. Rebelo, M. Sher, J. P. Silva "Theory and Phenomenology of two-Higgs-doublet Models", Physics Reports 516.1-2 (2012): 1-102. doi: 10.1016/j.physrep.2012.02.002

F. J. Botella and J. P. Silva, "Jarlskog-like Invariants for Theories with Scalars and Fermions", Physical Review D 51.7 (1995): 3870-3875. doi: 10.1103/PhysRevD.51.3870

P.M. Ferreira, Rui Santos, Marc Sher, and João P. Silva; "Implications of the LHC two-photon Signal for two-Higgs-doublet Models", Physical Review D 85.7 (2012). doi:10.1103/PhysRevD.85.077703

Luís Oliveira e Silva

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PhD: Instituto Superior Técnico,1997.
Scientific Area: Plasma Physics, Lasers and Nuclear Fusion
Current Position: Full Professor

Research Areas & Interests:
Luís Oliveira e Silva's scientific contributions are focused in the interaction of intense beams of particles and lasers with plasmas. He has authored over 180 papers (5 Nature Physics, 1 Nature Communications, 1 PNAS, 27 Physical Review Letters, 6 Astrophysical Journal Letters), and three patents. He has supervised 11 PhD students and 8 post-doctoral fellows. He was awarded two ERC Advanced Grants (2010 and 2015).

He was awarded the 2011 Scientific Prize of Technical University of Lisbon, Young Scientist 2009 at the Summer Davos 2009 of the World Economic Forum, the IBM Scientific Prize 2003, the 2001 Abdus Salam ICTP Medal for Excellence in Nonlinear Plasma Physics by a Young Researcher, and the Gulbenkian Prize for Young Researchers in 1994. He was elected Fellow of the American Physical Society and to the Global Young Academy in 2009.

Selected References:
M. Vranic, T. Grismayer, J. L. Martins, R. A. Fonseca, L. O. Silva, "Particle Merging Agorithm for PIC Codes" Computer Physics Communications,191, 65-73-2015. doi: 10.1016/j.cpc.2015.01.020

S. Tochitsky, D. Haberberger, C. Gong, F. Fiuza, C. Joshi, R. A. Fonseca, L. O. Silva, W. B. Mori, "Collisionless Shocks in Laser-produced Plasma Generate Monoenergetic High-energy Proton Beams", Nature Physics. 8 (1), 95-99-2012. doi: 10.1038/nphys2130

S. F. Martins, R. A. Fonseca, W. Lu, W. B. Mori and L. O. Silva, "Exploring Laser-wakefield-accelerator Regimes for Near-term Lasers using Particle-in-cell Simulation in Lorentz-boosted Frames" Nature Physics 6, 311 - 316 (2010). doi: 10.1038/nphys1538S

Luís Silva

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PhD: Universidade Técnica de Lisboa, 2011.
Scientific Area: Particle Physics and Nuclear Physics
Current Position: Invited Assistant Professor

Research Areas & Interests:
Nucleon spin structure and parton spin contribution.
Strangeness in heavy ion collisions.
RPC detector studies and optimisation.
Detector efficiency studies and simulations.

Selected References:
L. Silva et al., "Leading-order Determination of the Gluon Polarisation Using a Novel Method", (COMPASS Collaboration)", Phys.Lett. B718 (2013) 922-930. arXiv:1512.05053

L. Silva et al., "The Characterisation of the Multianode Photomultiplier Tubes for the RICH-1 Upgrade Project at COMPASS", Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment 595.1 (2008): 177-179. doi:10.1016/j.nima.2008.07.074

G. Kornakov et al., "Time of Flight Measurement in Heavy-ion Collisions with the HADES RPC TOF Wall", J. Inst. 9.11 (2014): C11015-C11015. doi: 10.1088/1748-0221/9/11/C11015

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PhD: Université d'Orléans, 2004.
Scientific Area: Plasma Physics, Lasers and Nuclear Fusion
Current Position: Invited Assistant Professor

Research Areas & Interests:
Assistant Researcher at IPFN and Invited Assistant Professor at the Physics Department of IST. He has an Aerospace Eng. degree from IST (2001) and a Ph.D in Plasma Physics from the Université d'Orléans, France (2004). Since 2001 he has worked on the topic of nonequilibrium kinetic and radiative processes in low-pressure, high-speed hydrodynamic plasmas, with the application to spacecraft reentry flows. He has been participating in several technology research programs funded by the European Space Agency, and is the Manager of the IPFN Hypersonic Plasmas Laboratory, which hosts the largest Space research facility in Portugal, the European Shock-Tube for High Enthalpy Research (ESTHER). He has participated in 16 research programmes (3 as Project leader) has 23 publications in International peer-reviewed journals (13 as first author), 3 book chapters, 10 invited talks, and 64 conference proceedings. He has supervised/co-supervised 6 MSc thesis.

Selected References:
"Plasmas Hipersónicos ou como as naves atravessam um 'bunker' espacial em Lisboa", Observador, 4 de Março de 2015. http://observador.pt/especiais/plasmas-hipersonicos-tao-rapidos-que-nem-se-veem/

M. Lino da Silva, V. Guerra, and J. Loureiro, "A Review of Non-Equilibrium Dissociation Rates and Models for Atmospheric Entry Studies", Plasma Sources Science and Technology, Vol. 18, 034023, 2009, pp. 1-11. doi: 10.1088/0963-0252/18/3/034023.

M. Lino da Silva, V. Guerra, and J. Loureiro, "State-Resolved Dissociation Rates for Extremely Nonequilibrium Atmospheric Entries", Journal of Thermophysics and Heat Transfer, Vol. 21, No. 1, 2007, pp. 40-49. doi: 10.2514/1.24114

António Jorge Silvestre

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PhD: Universidade de Lisboa,1997.
Scientific Area: Condensed Matter and Nanotechnology
Current Position: Invited Associate Professor

Research Areas & Interests:
António Jorge Silvestre is member of the Center of Physics and Engineering of Advanced Materials (CeFEMA). His current scientific interests include the deposition of functional oxide thin films (e.g. CrO_2, Fe_3O_4, transition metal doped TiO_2 and SnO_2) by chemical and physical methods, and their structural, optical, electrical and magnetic properties. He has been also interested on the synthesis and characterization of nanostructured materials. In particular, he has been working on transition metal doped TiO_2 and SnO_2 nanoparticles and titanate nanotubes with potential application in photocatalysis for the degradation of organic pollutants. He has published 33 papers in international journals and several other papers in proceedings of international conferences. He is co-author of 1 book.

Selected References:
T. J. Entradas, J. C. Cabrita, B. Barrocas, M. R. Nunes, A. J. Silvestre, and O. C. Monteiro, "Synthesis of Titanate Nanofibers Co-sensitized with ZnS and Bi_2S_3 Nanocrystallites and their Application on Pollutants Removal", Materials Research Bulletin 72 (2015) 20. doi: 10.1016/j.materresbull.2015.07.008

T. Entradas, J. Cabrita, S. Dalui, M. R. Nunes, O. C. Monteiro and A. J. Silvestre, "Synthesis of sub-5 nm Co-doped SnO_2 Nanoparticles and their Structural, Microstructural, Optical and Photocatalytic Properties", Materials Chemistry and Physics 147 (2014) 563. doi 10.1016/j.matchemphys.2014.05.032

V. C. Ferreira, M. R. Nunes, A. J. Silvestre and O. C. Monteiro, "Synthesis and Properties of Co-doped Titanate Nanotubes and their Optical Sensitization with Methylene B lue", Materials Chemistry and Physics 142 (2013) 355. doi: 10.1016/j.matchemphys.2013.07.029

Alfred Stadler

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PhD: Karl-Franzens Universität Graz, 1989.
Scientific Area: Particle Physics and Nuclear Physics
Current Position: Assistant Professor

Research Areas & Interests:
Alfred Stadler's research activities are focused on the theory of strongly interacting particles. In particular, he has developed a relativistic model of the interaction between two nucleons (neutrons and protons), and has shown, by solving the corresponding relativistic three-nucleon equations exactly, that they lead to an accurate description of the three-nucleon bound states (the light nuclei tritium and helium-3). Currently he investigates the structure of mesons as relativistic quark-antiquark bound states. He teaches physics at the University of Évora and has supervised two Masters and two PhD theses.

Selected References:
A. Stadler, W. Glöckle, and P. U. Sauer, "Faddeev Equations with Three-Nucleon Force in Momentum Space", Physical Review C 44, 2319 (1991). doi: 10.1103/PhysRevC.44.2319

Alfred Stadler and Franz Gross, "Relativistic Calculation of The Triton Binding Energy and its Implications", Physical Review Letters 78, 26 (1997). doi: 10.1103/PhysRevLett.78.26

Franz Gross and Alfred Stadler, "Covariant Spectator Theory of np Scattering: Phase Shifts Obtained from Precision Fits to Data Below 350 MeV", Physical Review C 78, 014005 (2008). doi: 10.1103/PhysRevC.78.014005

João Varela

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PhD: École polytechnique/ Univ. Paris, 1984.
Scientific Area: Particle Physics and Nuclear Physics
Current Position: Associate Professor with *Agregação*

Research Areas & Interests:
Joao Varela has 30 years of research experience in Particle Physics collaborations at CERN where he has several coordination positions, including Deputy Spokesperson of the CMS Collaboration (2012-13) and Project Coordinator of the CT-PPS Proton Spectrometer (since 2014). He participated in the creation of LIP where he served as co-director until mid nineties. He led the consortia that built the first PET imaging scanner developed in Portugal. He promoted the creation of the startup PETsys. He coordinated 50 scientific projects with a total funding of about 20 M€. He received the Silver medal of the CNRS France awarded to the NA38 collaboration and the EPS HEPP Prize awarded to the ATLAS and CMS collaborations for the discovery of a Higgs boson. He is co-author of more than 450 scientific publications. He is editor of two scientific journals. He is member of the Board of the EPS High Energy Particle Physics Division. He supervised 16 MSc and 15 PhD thesis.

Selected References:
"A nNw Boson with a Mass of 125 GeV Observed with the CMS Experiment at the Large Hadron Collider", The CMS Collaboration, Science 21 Dec 2012, Vol. 338, Issue 6114, pp. 1569-1575, doi: 10.1126/science.1230816

"The Production of J/Ψ in 200 GeV/nucleon Oxygen-uranium Interactions", The NA38 Collaboration, Physics Letters B, Volume 220, Issue 3, 6 April 1989, Pages 471-478, doi:10.1016/0370-2693(89)90905-2

J. Varela, O Século dos Quanta, (Gradiva, Colecção Ciência Aberta, 1996), ISBN: 978-972-662-491-2

Vitor Rocha Vieira

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Scientific Area: Condensed Matter and Nanotechnology
Current Position: Invited Full Professor

Research Areas & Interests:
I study strongly correlated systems and applications to condensed matter and quantum information. The goal is to understand phase transitions, namely superconductivity, ferromagnetism, superfluidity and topological phase transitions. In particular, I use methods of quantum information theory. I am the Coordinator of the PhD Programs in Physics and in Technological Physics Engineering.

Selected References:
B. Mera, M. A. N. Araujo and V. R. Vieira, "Properties of Some Hamiltonians Describing Topologically Non-trivial Fermionic Systems". Journal of Physics Condensed Matter, 27, 465501 (2015). doi: 10.1088/0953-8984/27/46/465501

P. Ribeiro and V. R. Vieira, "Non-Markovian Effects in Electronic and Spin Transport", Phyical Review B 92, 100302(R) (2015). doi: 10.1103/PhysRevB.92.100302

B. Mera, V. R. Vieira and V. K. Dugaev, "Dynamics of Magnetic Moments Coupled To Electrons and Lattice Oscillations", Physical Review B 88, 184419 (2013). doi: 10.1103/PhysRevB.88.184419

António Ferraz

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Scientific Area: Condensed Matter and Nanotechnology
Current Position: Assistant Professor

David Pacheco Resendes

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Scientific Area:
Current Position: Assistant Professor

João Carlos Ferreira Fernandes

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Scientific Area: Interdisciplinary Physics
Current Position: Assistant Professor

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Scientific Area:
Current Position: Invited Full Professor

Teaching Collaborators

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PhD: Instituto Superior Técnico, 2002.
Scientific Area: Particle Physics and Nuclear Physics

Research Areas & Interests:
My main scientific interest is experimental physics and the interactions of powerful lasers with very hot plasmas. During the last two decades I worked continuously in plasma engineering, gas laser manufacture and optical diagnostics for the nuclear fusion experiments. In this moment I'm doing consulting on research projects for funding and Lecturing in Experimental physics for engineering undergraduate students at "Instituto Superior Técnico" School of Engineering from the University of Lisbon.

Selected References:
M. P. Alonso, P. D. Wilcock, C. A. F. Varandas, "A Multipoint Thomson Scattering Diagnostic For The Tokamak ISTTOK"., Rev. Sci. Instrum. 70.1 (1999): 783. doi:10.1063/1.1149401

O. C. Usuriaga, F. O. Borges, A. G. Elfimov, R. P Da Silva, M. H. Ono, P. Puglia et al., "Analysis Of The Electron Temperature Measurement In TCABR Tokamak By Electron Cyclotron Emission And Infrared Thomson Scattering Diagnostics", Journal of Physics: Conference Series 511 (1), 012039 http://stacks.iop.org/1742-6596/511/i=1/a=012039

Liliana Apolinário

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PhD: Universidade de Santiago de Compostela, 2013.
Scientific Area: Particle Physics and Nuclear Physics

Research Areas & Interests:
Liliana Apolinário works in high-energy physics. She contributes to the improvement of the theory of strong interactions (QCD) in the high dense and high temperature regime (Jet Quenching). In particular, to the phase space available in collider physics, such RHIC and at the LHC, in ultra-relativistic heavy-ion collisions. She also does phenomenological works related to the development of jet observables and Monte Carlo event generators to assess the properties of the new state of matter that is created in such events, the Quark-Gluon Plasma (QGP). She has published 6 papers in peer-reviewed international journals (plus 2 already accepted but without DOI), gave more than 20 talks in main conferences of the field, 8 of each were invited (3 for doing general reviews of Jet Quenching).

Selected References:
L. Apolinário, N. Armesto, G. Milhano and C. A. Salgado, "Medium-induced Gluon Radiation and Colour Decoherence beyond the Soft Approximation", JHEP02 (2015)119

L. Apolinário, N. Armesto, G. Milhano and C. A. Salgado, "Energy Loss and (De)Coherence Effects beyond Eikonal Approximation", Nucl.Phys. A931 (2014) 365-370.

L. Apolinário, N. Armesto and L. Cunqueiro, "An Analysis of the Influence of Background Subtraction and Quenching on Jet Observables in Heavy-ion Collisions", JHEP02 (2013)022

Samuel Balula

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Scientific Area: Interdisciplinary Physics

Research Areas & Interests:
Samuel Balula is developing tools to control electro-mechanical systems optimally, by creating models, numerical methods and hardware. He has also been collaborating in the development of e-lab remote laboratory, where real physics experiments are made available online, and lecturing the laboratory classes of microcontrollers. He has published 9 papers in international journals and conference proceedings, and was awarded the "Excellent Teacher" distinction at IST in 2016. He is currently preparing his master thesis.

Selected References:
A. S. Balula, R. Marques, J. Loureiro, J. Fortunato, T. Pereira, and H. Fernandes, "E-lab's Elastic Collision Distributed Remote Laboratory". 2014 11th International Conference on Remote Engineering and Virtual Instrumentation (REV) (2014) doi:10.1109/REV.2014.6784220

R. B. Neto, H. Fernandes, T. Pereira, I. Borges, G. Amarante-Segundo, S. Balula et al, "Globally Distributed Pendulum Experiment As An Educational Resource On E-Lab". International Journal of Online Engineering (iJOE) 9.S8 (2013): 47. doi: 10.3991/ijoe.v9iS8.3381

S. Balula, R. Henriques, J. Fortunato, T. Pereira, H. Borges, G. Amarante-Segundo and H. Fernandes "Distributed E-Lab Setup Based On The Raspberry Pi: The Hydrostatic Experiment Case Study". 2015 3rd Experiment International Conference (exp.at'15) (2015). doi: 10.1109/EXPAT.2015.7463280

Victoria Corregidor

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PhD: Universidade Autonoma de Madrid, 2003.
Scientific Area: Plasma Physics, Lasers and Nuclear Fusion

Research Areas & Interests:
I characterize materials (semiconductors, metals, etc.) with ion beam analytical techniques. With these techniques it is possible to obtain information about the elemental composition or the depth distribution. These techniques can also be used to study cultural heritage objects.

Selected References:
J. Cruz, E. Figueiredo, V. Corregidor, P. I. Girginova, L.C. Alves, C. Cruz, R. J.C. Silva, I. Liritzis, "First Results on Radiometric Dating of Metals by Alpha Spectrometry" Microchemical Journal 124 (2016): 608-614. doi: 10.1016/j.microc.2015.10.001

S. Cabo Verde, T. Silva, V. Corregidor, L. Esteves, M. I. Dias, V. Souza-Egipsy, C. Ascaso, J. Wierzchos, L. Santos, M. I. Prudêncio, "Microbiological and Compositional Features of Green Stains in the Glaze of the Portuguese 'Great View of Lisbon' Tile Panel", Journal of Materials Science 2015 v.50 no.20 pp. 6656. doi:10.1007/s10853-015-9217-4

A. Redondo-Cubero, V. Corregidor, L. Vázquez, L. C. Alves,"Self-consistent Depth Profiling and Imaging of GaN-based Transistors Using Ion Microbeams", Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms348 (2015): 246-250. doi: 10.1016/j.nimb.2014.11.040

David Emanuel Costa

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Phone: +351 218419112

PhD: Universidade Técnica de Lisboa, 2001.
Scientific Area: Particle Physics and Nuclear Physics

Research Areas & Interests:
David Emanuel Costa investigates several topics of particle physics, namely flavour physics, neutrino physics, grand unified models, proton decay, baryon asymmetry of the Universe. He is member of the CFTP - IST. He has published 33 papers and proceedings in international journals. He has supervised 3 MSc and 2 PhD thesis.

Selected References:
D. Emmanuel-Costa, S. Wiesenfeldt. “Proton Decay in a Consistent Supersymmetric GUT Model”. Nuclear Physics B 661.1-2 (2003): 62-82. doi: 10.1016/S0550-3213(03)00301-8

G. C.Branco, D. Emmanuel-Costa, and R. González Felipe. “Texture Zeros and Weak Basis Transformations”. Physics Letters B 477.1-3 (2000): 147-155. doi: 10.1016/S0370-2693(00)00193-3

I. de Medeiros Varzielas and D. Emmanuel-Costa. “Geometrical Spontaneous CP Violation”. Physical Review D 84.11 (2011). doi: 10.1103/PhysRevD.84.117901

Fábio Cruz

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PhD: Universidade de Lisboa (expected 2020)
Scientific Area: Plasma Physics, Lasers and Nuclear Fusion

Research Areas & Interests:
Fábio Cruz is a PhD student at the APPLAuSE doctoral program on Plasma Science and Engineering. His research interests range from the interaction between matter and electromagnetic fields in extreme astrophysical scenarios to scientific visualisation. He has taught problem solving classes and supervised laboratory sessions in 'Mechanics and Waves'. Before graduating, he was a member of Pulsar, a Portuguese science communication magazine distributed nationwide entirely developed by students.

João Fortunato

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Scientific Area: Plasma Physics, Lasers and Nuclear Fusion

Research Areas & Interests:
João Fortunato designs control and data acquisition systems for Nuclear Fusion devices. He is currently developing a module to be used in the ITER Fast Interlock System to provide fast protection to the ITER Electron Cyclotron heating system Power Supplies. He has also been a very close collaborator with the IST Physics Students Association, NFIST, creating new experiments and participating in many science outreach activities.

Selected References:
D. F. Valcárcel, A. Neto, J. Sousa, B. B. Carvalho, H. Fernandes, J. C. Fortunato, A. S. Gouveia, A. J. N. Batista, A. G. Fernandes, M. Correia, T. Pereira, I. S. Carvalho, A. S. Duarte, C. A. F. Varandas, M. Hron, F. Janky and J. Písačka, "An ATCA Embedded Data Acquisition and Control System for the Compass tokamak", Fusion Engineering and Design, 84(7-11):1901-1904, 2009. doi: 10.1016/j.fusengdes.2008.12.011

M. Hron, F. Janky, J. Pipek, J. Sousa, B. B. Carvalho, H. Fernandes, P. Vondracek, P. Cahyna, J. Urban, R. Paprok, O. Mikulín, M. Aftanas, R. Panek, J. Havlicek, J. Fortunato, A.J.N. Batista, B.A. Santos, A. Duarte, T. Pereira and D.F. Valcárcel. "Overview of the COMPASS CODAC System", Fusion Engineering And Design, October 2013. doi:10.1016/j.fusengdes.2013.09.010

S. Balula, R. Henriques, J. Fortunato, T. Pereira, H. Borges, G. S. Amarante-Segundo, and H. Fernandes, "Distributed e-lab Setup Based on the Raspberry Pi: the Hydrostatic Experiment Case Study". 3rd Experiment@International Conference - exp.at'15, 2015. doi: 10.1109/EXPAT.2015.7463280

Rogério Jorge

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PhD: Instituto Superior Técnico, (Expected 2018)
Scientific Area: Plasma Physics, Lasers and Nuclear Fusion

Research Areas & Interests:
PhD student, in the joint initiative IST-EPFL. Mainly focused on the edge region of magnetic confinement fusion devices (tokamaks), but also in general relativistic extensions of the MagnetoHydroDynamics (MHD) formalism. The studies on plasma turbulence in tokamaks is done through simulations with GBS, a code developed in the Swiss Plasma Center at EPFL, Switzerland. At IPFN, IST, with the data from the ISTTOK tokamak, a validation of this code is performed and a novel theoretical formalism for the outer boundary of tokamaks is developed.

Selected References:
R. Jorge, E. S. de Oliveira, and J. V. Rocha, “Greybody Factors for Rotating Black Holes in Higher Dimensions”, Class. Quantum Grav. 32.6 (2015): 065008. doi: 10.1088/0264-9381/32/6/065008

G. L. Cardoso, R. Jorge and S. Nampuri, “Indefinite Theta Functions and Black Hole Partition Functions”, Journal of High Energy Physics 2014.2 (2014). doi: 10.1007 / JHEP02 (2014) 019

Sofia C. Leitão

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PhD: Universidade de Lisboa (expected 2017).
Scientific Area: Particle Physics and Nuclear Physics

Research Areas & Interests:
Sofia Leitão student at IST at CFTP. Her research field is Hadronic Physics, the study of strongly-interacting matter with the aim to understand its properties and interactions in terms of the underlying fundamental theory, i.e. Quantum Chromodynamics. She interested in the investigation of the two emergent phenomena of the strong interaction: confinement – the fact that single quarks are not observed in isolation – and dynamical chiral-symmetry breaking – the origin of most of the mass of ordinary matter in the Universe. These phenomena dominate the observed properties of hadrons measured in experiments at LHC, JLab, FAIR-GSI, and the BES Collaboration, and they can be studied theoretically through dynamical quark models describing hadrons. She published 1 article and 7 proceeding papers. She was awarded the "Excellent Teacher" distintion at IST in 2015.

Selected References:
S. Leitão et al. "Linear Confinement In Momentum Space: Singularity-Free Bound-State Equations". Physical Review D 90.9 (2014). doi: 10.1103/PhysRevD.90.096003

Katharina Lorenz

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PhD: University of Bonn
Scientific Area: Condensed Matter and Nanotechnology

Research Areas & Interests:
Katharina Lorenz is researcher of DECN working on semiconductor physics. She has been teaching at the Department of Physics since 2012.

Selected References:
A. Redondo-Cubero, K. Lorenz, E. Wendler, S. Magalhães, E. Alves, D. Carvalho, T. Ben, F. M. Morales, R. García, K. P. O'Donnell and C. Wetzel," Analysis of the Stability of InGaN/GaN Multiquantum Wells Against Ion Beam Intermixing" Nanotechnology 26 (2015) 425703. doi:10.1088/0957-4484/26/42/425703

M. A. Sousa, T.C. Esteves, N. Ben Sedrine, J. Rodrigues, M.B. Lourenço, A. Redondo-Cubero, E. Alves, K.P. O'Donnell, M. Bockowski, C. Wetzel, M.R. Correia, K. Lorenz, T. Monteiro, "Influence of Nitrogen Implantation and Thermal Annealing on the Optical Properties of Green Emitting InGaN/GaN Multiple Quantum Wells", Scientific Reports 5 (2015) 09703. doi: 10.1038/srep09703

S. Magalhães, I. M. Watson, S. Pereira, N. Franco, L. T. Tan, R. W. Martin, K. P. O'Donnell, E. Alves, J. P. Araújo, T. Monteiro and K. Lorenz, "Composition, Structure and Morphology of Al1−xInxN Thin Films Grown on Al1−yGayN Templates with Different GaN Contents" J. Phys. D: Appl. Phys. 48 (2015) 015103. doi:10.1088/0022-3727/48/1/015103

Rodrigo Mateus

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PhD: Universidade de Lisboa, 2004.
Scientific Area: Plasma Physics, Lasers and Nuclear Fusion

Research Areas & Interests:
Presently, Rodrigo Mateus is responsible for a curricular course in "Thermodynamics and the Structure of Matter" and also supports the courses of "Electromagnetism and Optics" and "Mechanics and Waves" at IST. The research activity is focused on the development of ion beam techniques involving nuclear reactions for light element quantification and in the domain of Plasma Surface Interaction (PSI) in tokamaks in the scope of the Eurofusion consortium, namely, the retention and reactivity of deuterium (2H), nitrogen (N) and oxygen (O) in beryllium (Be), carbon (C) and tungsten (W) plasma facing components or in liquid metals as tin (Sn), gallium (Ga) and lithium (Li). He published 40 papers in these domains in international journals.

Selected References:
R. Mateus, P.A. Carvalho, N. Franco, E. Alves, C. Porosnicu, C.P. Lungu, "Growth of Mixed Materials in the Be/W/O System in Fusion dDvices", Microsc. Microanal. 21 (2015) 94. doi:10.1017/S1431927614014172

R. Mateus, N. Franco, E. Alves, "Retention Behaviour of Deuterium and Helium in Beryllium Under Single D+ and Dual He+/D+ Exposure", Fusion Eng. Des. 98–99 (2015) 1362, doi:10.1016/j.fusengdes.2015.06.127

C. Pardanaud et al., "Raman Microscopy Investigation of Beryllium Materials", Phys. Scr. T167 (2016) 014027, doi:10.1088/0031-8949/T167/1/014027

José Guilherme Milhano

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PhD: University of Oxford, 2002.
Scientific Area: Particle Physics and Nuclear Physics

Research Areas & Interests:
José Guilherme Milhano studies properties of strongly interacting matter in extreme conditions. His work is particularly focused on the characterization of Quark Gluon Plasma through the use of jets and on the determination of the initial conditions in collisions involving nuclei. He has made over the years significant contributions to both topics. He has responsible for the 'Analytical Mechanics' course for the last 2 years. His publications (30 papers in international journals, 17 peer-reviewed proceedings published as original research, and 1 book chapter) have been cited over 1700 times. He has supervised 2 MSc and 1 PhD theses.

Selected References:
L. Apolinário, N. Armesto, J. G. Milhano, C. A. Salgado, "Medium-induced Gluon Radiation and Colour Decoherence Beyond the Soft Approximation", Journal of High Energy Physics, February 2015. doi: 10.1007/JHEP02(2015)119

J.Casalderrey-Solana, D. C. Gulhan, J. G. Milhano, D. Pablos, K. Rajagopal, "A Hybrid Strong/Weak Coupling Approach to Jet Quenching", Journal of High Energy Physics, October 2014.10 (2014). doi: 10.1007/JHEP10(2014)019

J. L. Albacete, N. Armesto, J. G.Milhano, P. Quiroga Arias, C. A. Salgado,"AAMQS: A Non-linear QCD Analysis of New HERA Data at Small-x Including Heavy Quarks", Eur. Phys. J. C 71.7 (2011). doi: 10.1140/epjc/s10052-011-1705-3

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PhD: Universidade de Lisboa (expected 2019)
Scientific Area: Particle Physics and Nuclear Physics

Research Areas & Interests:
Particle Physics, Cosmic Rays, Solar Modulation, Computational Physics.

Selected References:
M. Aguilar et al. (AMS Collaboration), “Precision Measurement of the Helium Flux in Primary Cosmic Rays of Rigidities 1.9 GV to 3 TV with the Alpha Magnetic Spectrometer on the International Space Station”, Phys. Rev. Lett. 115, 211101 – Published 17 November, 2015. doi: 10.1103/PhysRevLett.115.211101

M. Aguilar et al. (AMS Collaboration), ”Precision Measurement of the Proton Flux in Primary Cosmic Rays from Rigidity 1 GV to 1.8 TV with the Alpha Magnetic Spectrometer on the International Space Station”, Phys. Rev. Lett. 114, 171103 – Published 30 April. 2015. doi:10.1103/PhysRevLett.114.171103

M. Aguilar et al. (AMS Collaboration),”Electron and Positron Fluxes in Primary Cosmic Rays Measured with the Alpha Magnetic Spectrometer on the International Space Station”,Phys. Rev. Lett. 113, 121102 – Published 18 September 2014. doi: 10.1103/PhysRevLett.113.121102

Márcia Quaresma

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PhD: Universidade de Lisboa, 2016.
Scientific Area: Particle Physics and Nuclear Physics

Research Areas & Interests:
Márcia Quaresma has finished her PhD in 2016 in spin physics at COMPASS, a CERN experiment. She has published 26 papers in international journals.

Selected References:
"Experimental Investigation Of Transverse Spin Asymmetries In M-P SIDIS Processes: Collins Asymmetries". Physics Letters B 717.4-5 (2012): 376-382. doi: 10.1016/j.physletb.2012.09.055,

"Experimental Investigation Of Transverse Spin Asymmetries In M-P SIDIS Processes: Sivers Asymmetries". Physics Letters B 717.4-5 (2012): 383-389. doi: 10.1016/j.physletb.2012.09.056,

"The Spin Structure Function gp1 of the Proton and a Test of the Bjorken Sum Rule", Physics Letters B 753: 18-28. doi: 10.1016/j.physletb.2015.11.064

Ayouchi Rachid

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PhD: Universidade de Málaga, 2005.
Scientific Area: Condensed Matter and Nanotechnology

Research Areas & Interests:
Rachid Ayouchi worked on the potential of ZnO as a substitute to Gallium Nitride. ZnO has exceptional electrical and optical properties is inexpensive, relatively abundant and chemically stable. Additionally, the semiconducting and piezoelectric properties of the environmental friendly ZnO are extremely interesting for energy harvesting devices. The research was then extended to zinc nitrides with its promising electrical and optical properties for transistor channels. Since 2010, his research interest shifted to ferroelectric materials due to the need to find new Lead-free materials for piezoelectric energy harvesting applications, capable of replacing PZT. Initially, his investigation focused on the study of its electrical and optical properties with regard to optoelectronic applications. In addition to his research, he obtained a wide range of teaching experience for different first cycle undergraduate programs and Semiconductor Physics to second cycle undergraduates as well as post-graduate. He has published 26 papers in international journals and co-supervised 3 MSc thesis.

Selected References:
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PhD: University of California Santa Barbara, 2008.
Scientific Area: Astrophysics and Gravitation

Research Areas & Interests:
J. Rocha is a theoretical physicist with multidisciplinary interests spanning gravity, astrophysics and high-energy physics. His current research focuses on strong gravity in dynamical regimes. More specifically, his recent work concerns gravitational collapse and black hole formation -- including effects from non vanishing rotation or from confinement -- and its connection with cosmic censorship. J. Rocha has published 26 original articles in top international journals. In 2015, he was granted a 2-year Marie Sklodowska-Curie European Fellowship to develop his line of research at University of Barcelona. He has supervised 1 MSc thesis and co-supervised 1 PhD student and 2 other MSc students.

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Current Position: Technical Assistant

Administrative Duties:
Ana Bela Cardoso's main activity is the support of the MEFT Coordination. She is responsible for the organization and structure of the Secretariat regarding the course "MEFT Project", including the disclosure of videos in a public website. She is also responsible for the procedures required for the submission and public presentation of the final masters dissertation by MEFT students. She also supports the "Welcome Week" for 1st year MEFT students and other events held in the Department of Physics. She is also in charge of the different aspects related to the MEFT students in ERASMUS.

Hélder Carvalho

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Current Position: Laboratory Technician

Administrative Duties:
Hélder Carvalho provides technical support to the Experimental Physics Laboratories (Thermodynamics and Structure of Matter, Electromagnetism and Optics, Mechanics and Waves) and the LFEB (Basic Experimental Physics Laboratory) and LOO (Oscillations and waves Laboratory) Laboratories of MEFT.

Maria de Fátima Casquilho

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Current Position: Operational Assistant

Administrative Duties:
Fátima Casquilho provides support to the Dept of Physics secrearíat mainly in activities related to the Department of Physics archive and in analysis of curricular plans of students.

Pedro Claro

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Current Position: Operational Assistant

Administrative Duties:
Pedro Claro provides support for the Technological Laboratory. His expertise is in the fields of welding and works on metal parts. He also gives technical support to the Department of physics in various areas.

Dulce Maria Martins da Conceição

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Current Position: Senior Technician

Administrative Duties:
Dulce Conceição is a Senior Technician in the Department of Physics. She provides secretariat duties for CENTRA and CEFEMA.

Fátima Correia

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Current Position: Operational Assistant

Administrative Duties:
Fátima Correia's main activity is to support the DF's secretariat. She is involved in the support of students in daily activities, mail service (internal and external), management of various displays with information about department's activities. She is also involved with the archive of Assessment tests and written exams.

João Paulo dos Santos Guerreiro

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Current Position: Coordinator of Administrative Services

Administrative Duties:
João Paulo Guerreiro's main activity is to support the management and coordination of tasks of the Executive Commission of the Department of Physics, in particular, in the following areas: teaching, including organization of teaching activities, teaching permit applications for foreign employees; processing of the application of the Teaching Service Provision Regulation (RSD), order Sabbatical leaves; Teacher hiring guests under Clause 32a of ECDU, management of monitor's applications for assessment tests (tests and exams) of course units under the department's responsibility. He is also in charge of the procedures related with scholarships to support edu- cational activities. He participates in the organization of events organized by the Department of Physics and the MEFT coordination, such as the Workshop "MEFT-Challenging the Limits of Science and Technology" and the "Welcome Week at IST". He gives crucial support in the management and full implementation of funds allocated to the Department of Physics, in accordance with the decisions of the department's executive comission.

Daniel de Jesus Mendes Lála

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Current Position: Technical Assistant

Administrative Duties:
Daniel Lála works as a technician in the various laboratories, namely the Electronics, the Technological, and the DEMO-Demonstrations Laboratories. He also supports the filming and the production of short videos for the UC "Project MEFT" and provides technical support in various laboratories of the Department of Physics in the field of electronics. In 2015, he provided major support to the installation of the new laboratory for the "Project MEFT".

Sandra Rodrigues Martins

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Current Position: Technical Assistant

Administrative Duties:
Sandra Martins works at the Department of Physics' secretariat. In 2015, she had responsibilities in the maintenance of the department's website and the television with updated information about the scientific, pedagogical and outreach activities. She also participates in the organization of various department's initiatives such as the "Welcome week" for new students and the workshop "MEFT-Changing limits in science and technology" for high school students. She also provides support in the organization various tea-ching activities and students examinations.

Sandra Oliveira

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Current Position: Senior Technician

Administrative Duties:
Sanda Oliveira's activity is to support the activities of the following research units: CFTP - Centre for Theoretical Particle Physics and CEFEMA - Center of Physics and Engineering of Advanced Materials.

Martinha Viegas de Sousa

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Current Position: Senior Technician

Administrative Duties:
Martinha Viegas de Sousa's main activity is the secretariat of MEFT Coordination. Such work includes the schedule for MEFT procedures, compilation and completion of documents necessary for the process of annual assessment of MEFT, preparation of the beginning of each semester meetings. She also provides the secretariat of the "Welcome Week", a Department of Physics initative dedicated to new MEFT students and "MEFT-Challenging the Limits of Science and Technology", a department's initiative for high school students. She has been working on an effective implementation at the MEFT Secretariat of the administrative procedures in accordance with the changes and innovation of the various IST services to improve the quality efficiency of the secretariat support to the MEFT coordination. She has been in charge of maintaining updated information related to the UCs MEFT, DEAF, DEAEFT in the Portal Bologna. In 2015, she was involved in publication of the report for the process of MEFT Accreditation.

Department of Physics
Annual Report 2015

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