Centro de Instrumentação (Instrumentation Centre)  
http://c-instr.fis.uc.pt/  

Unit 217/94  
Physics Department – University of Coimbra  

Synopsis  

• radiation and particle physics, biomedical physics, digital processing techniques and embedded system platforms;  

• R&D and innovation in the generic field of instrumentation,  

  encompassing systems, apparatus, methods and basic science
Strategic Guidelines

• Producing original scientific material & promoting innovation through technology transfer

• Sustaining long-term collaborations (National/International; Scientific/Industrial/Services)

• Training of Post-grad and U-grad students and continuing education of technical staff

• Promoting of spin-off firms and employability involving graduates and technical staff

Organization

Three research groups:
(merge of former Units 217/94 and 732/02)

• GIAN – Atomic & Nuclear Instr. Group
  Radiation detection physics & instr.

• GEI – Electronic Instr. Group
  Data acquisition & signal processing
  Biomed instr.

• GAII – Automation & Industrial Instr. Group
  Control and automation instr.
  Industrial Wireless Sensor Networks
Merging Objectives

- Enlarge know-how and competences
- Increase manpower beyond critical mass
- Increase efficiency
- Comply with recommendations of 2003 Physics Evaluation Panel.

Synergies

- GIAN: Detector signals, Imaging devices
- GAIi: Control, Automation
- GEI: Data acquisition, Pulse processing
CI-Members

- 1 Full Professor
- 2 Associate Professors
- 1 Principal Researcher
- 10 Assistant Professors
- 1 Coordinator Professor (Politechnic School)
- 2 Assistant Professors (Politechnic School)
- 1 Professor Emeritus
- 1 Invited Full Professor (PSI; 07-08)
- 3 Post-Docs
- 18 PhD students

* In the last 4-year period (03-06): ~16 PhD members (on average)

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<th>CI-Members Affiliations</th>
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<tr>
<td>FCTUC – 14</td>
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<td>UBI – 2</td>
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<td>IPC – 1</td>
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* Post-Docs – FCTUC (FCT grants)

** PhD Students: 1- UA; 1- UBI; 1- IPC; 2- CFN; 2- collaboration with Civil Eng. Dept., FCTUC; 11 – FCTUC (FCT grants)
CI-Members Outreach Activities (03-06)

- **CMBA Correia**: - Member of the Phys. Dept. Executive Committee;
  - Member of the Graduate Studies Committee;
  - President of ADDF;
- **LFR Ferreira** (03-05): - MCTES, “General Director for Higher Education”;
  - MCTES, Liaison for PRODEP III-POCTI;
  - Cabinet Chief of SEA MAI
- **JMF dos Santos**: - Member of the Phys. Dept. Executive Committee;
  - Member of the Graduate Studies Committee;
  - Coordinator of the Master in "Instrum. & Microelect."
  - Member of the Executive committee of ADDF;
  - President of the Regional Section of the Port. Phys. Soc.
- **FJA Cardoso**: - Director of the Automation & Instrumentation Unit of IPN
  - CTO & R&D Director of ENEIDA-Instrumentation, Sensing, Wireless, Lda
- **JB Simões**: - Vice-President of ADDF;
  - Coordinator of the Development Dept. of ISA Lda. (company);
  - Member of the Technical & Scientific Committee of XHMS (Centre for Excellence in HealthCare and Medical Solutions)
- **JAM Lopes** (04-06): - Vice-President of the Phys.-Mat. Dept., ISEC;
  - Vice-President of ISEC Executive Committee;
  - (06) Coordinator of the dossier for ISEC course on Biomed. Eng.
- **J Landeck**: - Member of the ACIC Executive Committee (Comm. & Indust. Assoc. - Coimbra)
  - Coordinator of the Applied Embedded Software Dept. of ISA Lda (company)

Results - Publications

![Bar chart showing publications by year]

*Results include 9 papers in J. of Instrum., new journal in 2004.*
Results - Citations

Total & External Citations

- Scopus > 1996
- ISI < 1995

Results – Ext.Cit. vs Pub.

Papers & External Citations

(4-year periods)
Future Goals (07-10)

• Improve scientific output
  (increase #papers/PhD and #Ext.-Citations/paper ratios).
• Have more papers published in high impact journals
• Increase the number of researchers with PhD
  (3 will be obtained via Ciência-2007 Programme – FCT)
• Increase the number of PhD & MSc students and support the new course on Biomed. Eng.
• Produce at least 2 patents
• strengthen the long-standing collaborations already existing
  (either scientific or with health units, industry or service providers)
• Collaborate with similar Centres
• Share PhD students with external partners

Future Networking Activities

• Integrate the State Associated Laboratory LAPIF
  (Associated Laboratory for Plasma Instrumentation and Fusion)
  – collaboration in the ITER programme.
• Participation in the Fisica–N consortium
• RD-51 (CERN): Micro-Pattern Gas Detectors
• Promoter of the recent LUBRA-X
  (Luso-Brasillian Network for applications of x-rays to cultural heritage)
  and IBAM-X (Ibero-American Network for applications of x-rays)
• Integrate the ASPERA and ELIAS network
  (European networks for Dark Matter Search experiments)
### Equipment request

- **Compact, portable quantitative x-ray analysis system (~80 kEu)**
  - Expand our competences for the already existing know-how;
  - **Share** with the **Atomic Physics Group** (Univ. Lisbon) (**New Collaboration**) LUBRA-X
  - Establish a facility & know-how in Portugal Centre Region for institutional collaborations
- **Bench milling machine, precision saw & workshop equipment (~40 kEu)**
- **Radioactive sources;** Fe-55, Cd-109, Po-210, Ni-68, Co-60, Cs-137, Na-22 (~20 kEu)
- **Leak detector (~18 kEu)**
- **Electronics CAD Software (10 kEu)**
- **Turbopump based vacuum system (~10 kEu)**
- **Microscope & Spectrometer - Ocean Optics (~8 kEu)**
- **Portable x-ray tube system with HV and Controller AmpTek (~7 kEu)**
- **Programmable liquid dispenser (~6kEu)**
- **Logic Analyzer + Mixed Signal Osciloscope (5 kEu)**