

# ION BEAMS 12

## Multidisciplinary Applications of Nuclear Physics with Ion Beams

June 6<sup>th</sup>-8<sup>th</sup>, 2012

Laboratori Nazionali di Legnaro (Padova), Italy

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### SCIENTIFIC PROGRAMME

#### Wednesday, June 6<sup>th</sup>

- 8:30-9:00 REGISTRATION  
9:00-9:10 *Welcome*, G. FIORENTINI, *INFN Legnaro Director*  
9:10-9:30 *Introduction (Fifty years of the Legnaro Laboratories)*, R.A. RICCI, *INFN Legnaro*

#### **SESSION** *Cultural Heritage*

*Chairman: DRAN, Jean-Claude (C2RMF)*

- 9:30-10:00 *Ion Beam Analysis in cultural heritage studies: milestones and perspectives*  
J.C. DRAN, *C2RMF, Paris, France*  
10:00-10:30 *The “New AGLAE” project: a new beamline dedicated to cultural heritage – Present status and future improvements*  
C. PACHECO, *C2RMF, Paris, France*  
10:30-11:00 *Present activities at LABEC, Florence*  
P. A. MANDÒ, *University of Florence and LABEC, Florence, Italy*  
11:00-11:30 Coffee break  
11:30-12:00 *Recent studies at Cedad with ion beam analysis and accelerator mass spectrometry*  
L. CALCAGNILE, *University of Salento, Lecce, Italy*  
12:00-12:30 *Basic and applied nuclear physics at CIRCE (Caserta)*  
F. TERRASI, *DSA-SUN and INFN Napoli*  
12:30-12:50 *New accelerator facilities for IBA and AMS measurements at IFIN-HH Magurele Romania*  
S. M. DOGARU, *IFIN-HH – Horia Hulubei National Institute of Physics and Nuclear Engineering and University of Bucharest, Romania*

#### **SESSION** *LNL Ion Beam Facilities*

*Chairman: RICCI, Renato Angelo (INFN Legnaro)*

- 12:50-13:10 *Interdisciplinary physics with small accelerators at LNL: status and perspectives*  
V. RIGATO, *INFN Legnaro, Italy*  
13:10-13:30 *The Tandem-ALPI-PIAVE accelerator complex of LNL*  
C. A. UR, *INFN Padova, Italy*  
13:30-14:30 Lunch

#### **SESSION** *Materials Modifications and Analysis*

*Chairmen: MAZZOLDI, Paolo (Padova University)  
and RIGATO, Valentino (INFN, Legnaro)*

- 14:30-15:05 *Ion beam analysis and modern materials science*  
L. C. FELDMAN, *Institute for Advanced Materials, Devices and Nanotechnology, Rutgers University, USA*

- 15:05-15:40 *An overview of the activities and developments at the Surrey Ion Beam Centre*  
R. P. WEBB, Surrey Ion Beam Centre University of Surrey, Guildford, UK
- 15:40-16:15 *Interdisciplinary research in France*  
M. TOULEMONDE, CIMAP-GANIL and University of Caen, France
- 16:15-16:45 Coffee break
- 16:45-17:20 *Ion beams for application in science and industry: activities in Germany and the European infrastructure project SPIRIT*  
W. MÖELLER, Helmholtz-Zentrum Dresden-Rossendorf, Germany
- 17:20-17:40 *Ion beam analyses of radionuclide migration in heterogeneous rocks*  
U. ALONSO, CIEMAT, Madrid, Spain
- 17:40-18:00 *Deflection of MeV protons by an unbent half-wavelength silicon nano-crystal*  
D. DE SALVADOR, University of Padova and INFN Legnaro, Italy
- 18:00-18:20 *Overview of the research activity on ion-beam lithography of single-crystal diamond at the University of Torino and partner institutions*  
P. OLIVERO, University of Torino and INFN Torino, Italy
- 18:20-18:40 *Nanostructuring superconductors by ion beams: from radiation hardness studies to materials engineering*  
G. GHIGO, Politecnico of Torino and INFN Torino, Italy

## Thursday, June 7<sup>th</sup>

8:30 REGISTRATION

### **SESSION** *Materials Modifications and Analysis 2*

*Chairmen: DELLA MEA, Gianantonio (Trento Univ.)  
and BERTI, Marina (Padova Univ.)*

- 9:00-9:35 *Nanostructured materials and nano bio experiments with energetic ion beams*  
D. K. AVASTHI, Inter-University Accelerator Centre, New Delhi, India
- 9:35-10:10 *Materials research at the CMAM-UAM*  
A. ZUCCHIATTI, Centro de Micro Analisis de Materiales, Universidad Autónoma de Madrid, Madrid, SPAIN
- 10:10-10:30 *Optical and magneto-optical properties of Au-based nanoparticles obtained by ion implantation in silica*  
G. MATTEI, University of Padova, Italy
- 10:30-10:50 *Nuclear cross-sections data for ion beam analysis*  
M. CHIARI, INFN Firenze, Italy
- 10:50-11:35 Coffee break  
**POSTER SESSION**
- 11:35-12:00 *Compositional measurements in SiO<sub>2</sub>-GeO<sub>2</sub> Fiber Bragg Gratings using a nuclear microprobe*  
M.C. JIMÉNEZ-RAMOS, Atomic, Molecular and Nuclear Physics Department and Centro Nacional de Aceleradores. Universidad de Sevilla, Spain
- 12:00-12:25 *Ge strips for channelling: fabrication process and steering effects of a 400 GeV proton beam*  
S. CARTURAN, Department of Physics, University of Padova, and INFN Legnaro, Italy
- 12:25-13:30 Lunch

**SESSION Radiation Physics**

**Chairmen: BELLI, Mauro (ISS Roma) and COLAUTTI Paolo (INFN Legnaro)**

- 13:30-14:05 **Fundamental Dosimetry of Ion Beams**  
H. RABUS, *Physikalisch-Technische Bundesanstalt -PTB-, Braunschweig, Germany*
- 14:05-14:25 **Track nanodosimetry of light ions**  
V. CONTE, *INFN Legnaro, Italy*
- 14:25-14:45 **An innovative neutron spectrometer based on CR39 track detectors**  
M. CARESANA, *Energy Department, Politecnico of Milano, Italy*
- 14:45-15:05 **The INFN Micro-Si Experiment: study and development of a silicon microdosimeter for radiation quality assessment**  
M. LORENZOLI, *Politecnico of Milano and INFN Milano, Italy*
- 15:05-15:25 **Setup of the BINS superheated drop detectors spectrometer and application to the Be(p,n) neutron energy spectrum determination**  
R. CIOLINI, *Department of Mechanical, Nuclear and Production Engineering, University of Pisa, Italy*
- 15:25-16:15 Coffee break  
**POSTER SESSION**

**SESSION Radiation Biophysics and Medicine**

**Chairmen: CHERUBINI, Roberto (INFN Legnaro) and BELLI, Mauro (ISS Roma)**

- 16:15-16:50 **Tracking down the links between ionising radiation and biological response: The importance of radiation track structure from a UK perspective**  
M.A. HILL, *Gray Institute for Radiation Oncology & Biology Department of Oncology, University of Oxford, UK*
- 16:50-17:10 **The Cyclotron Laboratory and the RFQ accelerator in Bern**  
M. NIRKKO, *Albert Einstein Center for Fundamental Physics, Laboratory for High Energy Physics (LHEP), University of Bern, Switzerland*
- 17:10-17:30 **Comparison of the biological effectiveness of 45 MeV c-ions and  $\gamma$ -rays in inducing early and late effects in normal human primary fibroblasts**  
M. A. TABOCCHINI, *Istituto Superiore di Sanità and INFN Roma 1, Gruppo Collegato Sanità, Roma, Italy*
- 17:30-17:50 **Non-linear effects induced by low doses of ionizing radiations of different quality**  
R. CHERUBINI, *INFN Legnaro, Italy*
- 17:50-18:10 **Radionuclides production by proton and deuteron beams irradiation**  
F. GROPPPI, *Department of Physics, University of Milano, Italy*
- 18:10-18:30 **Radiosensitizing effect of gold nanoparticles in carbon ion irradiation of Human Cervical cancer cells**  
H. KAUR, *Inter-University Accelerator Centre, New Delhi, India*
- 19:30 Social Dinner

## Friday, June 8<sup>th</sup>

9:00 *The INFN Commissione Scientifica 5: Status and Future developments*  
M. CARPINELLI, *University of Sassari and INFN Cagliari*  
Introduced by G. Fiorentini (LNL Director)

<b>SESSION</b>	<b>Radiation Damage</b>
	<b>Chairman: CARPINELLI, Massimo (Sassari University and INFN Cagliari)</b>
9:20-9:50	<i>Irradiation facility for multidisciplinary research at LNS</i> L. COSENTINO, <i>INFN-LNS, Italy</i>
9:50-10:05	<i>Ion beam testing of electronic components</i> S. PACCAGNELLA, <i>DEI-University of Padova, Italy and INFN Padova, Italy</i>
10:05-10:20	<i>The SIRAD irradiation facility at LNL</i> L. SILVESTRO, <i>University of Padova, and INFN LNL, Italy</i>
10:20-10:35	<i>MAPRAD: an INFN spin-off the validation of electronics components for space applications</i> F. DI CAPUA, <i>MAPRad srl, Perugia, Italy</i>
10:35-10:50	<i>Activity of Thales Alenia Space in the field of radiation testing of electronic components for space applications</i> M. SARNO, <i>Thales Alenia Space, Rome, Italy</i>
10:50-11:10	Coffee break

<b>SESSION</b>	<b>Ion Beam Facilities</b>
	<b>Chairman: LOMBARDI, Augusto (INFN Legnaro)</b>
11:10-11:30	<i>The Naples University 3 MV tandem accelerator</i> L. CAMPAJOLA, <i>University of Napoli, Italy</i>
11:30-11:50	<i>Industrial research activities at the Tandetron accelerator of Bologna</i> M. BIANCONI, <i>CNR-IMM Istituto per la Microelettronica e i Microsistemi, Bologna, Italy</i>

<b>SESSION</b>	<b>The European Network</b>
	<b>Chairman: RICCI, Renato Angelo (INFN Legnaro)</b>
11:50-12:00	<i>EFINION: The European Forum for Innovative applications of Nuclear ION beams and tools: an EC/FP7-ENSAR Network</i> S. HARISSOPOULOS, <i>Tandem Accelerator Laboratory, NCSR "Demokritos", Athens</i>
12:00-12:10	<i>ENSAR: Transnational Access to LNL and LNS</i> E. FIORETTO, <i>INFN National Laboratories of Legnaro, Italy</i>
12:10-12:30	<i>Concluding remarks</i> P. MAZZOLDI, <i>University of Padova, Italy</i>
12:30-14:00	Lunch
14:00-18:10	<i>Legnaro 50 years</i>