

NOTIZIARIO

Neutroni e Luce di Sincrotrone

ISSN 1592-7822 - Vol. 17 n. 2 Luglio 2012 Aut. Trib. Roman. 124/96 del 22-03-96 - Sped. Abb. Post. 70% Filiale di Roma - C.N.R. p.le A. Moro 7, 00185 Roma

Scientific
Reviews

Research
Infrastructures

Muon & Neutron
& Synchrotron Radiation News

School and
Meeting Reports



Published by CNR

(Publishing and Promotion of Scientific Information)
in collaboration with the Centro NAST of the
University of Rome Tor Vergata



Volume 17 n. 2 Luglio 2012
Aut. Trib. Roma n. 124/96 del 22-03-96

EDITOR

C. Andreani

CNR - PROMOTION AND COLLABORATIONS

M. Arata

CORRESPONDENTS

C. Blasetti, F. Boscherini, L. Bove, G. Cicognani,
A. Ekkebus, M. Forster, T. Guidi, C. Habfast,
B. Palatini, L. Paolasini, H. Reichert,
V. Rossi Albertini

ON LINE VERSION

V. Buttaro

CONTRIBUTORS TO THIS ISSUE

G. Admans, M. Altarelli, K.H. Andersen, C. Andreani,
J. Ankner, A. Bardoel, B. Ebeling, C. Habfast,
Th. Hansen, S. Klotz, V. Lauter, S. Magazù,
H. Reichert, J. Savin, Th. Strässle, S. Sukhishvili,
G. Szulczewski

EDITORIAL INFORMATION AND SUBSCRIPTIONS

S. Fischer

E-mail: nnts@roma2.infn.it

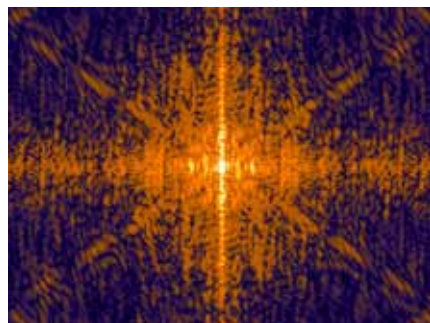
GRAPHIC DESIGN

N. Desii

PRINT

Stampa Sud SPA
Via P. Borsellino 7/9
74017 Mottola (TA) - Italy
e-mail: info@stampa-sud.it
www.stampa-sud.it

Finito di stampare nel mese di Luglio 2012



Cover photo

The picture shows a simulated diffraction pattern of the European XFEL logo. When user operation starts in 2016, the detectors at European XFEL will register thousands of diffraction patterns from objects like protein nanocrystals. The original shape of the object under investigation can be deduced by Fourier transform from the recorded patterns. (Image courtesy of B. Ebeling, XFEL).

Summary

Editorial News

- 2 ESRF Upgrade Programme Reaches Halfway Mark

Scientific Reviews

- 6 Building a road map for tailoring multilayer polyelectrolyte films
J. ANKNER, A. BARDOEL, S. SUKHISHVILI
- 8 Magnetism reflectometer study shows
LiF layers improve efficiency in spin valve devices
A. BARDOEL, V. LAUTER, G. SZULCZEWSKI
- 10 Magnetism in solid oxygen under pressure by neutron diffraction
S. KLOTZ, TH. HANSEN, TH. STRÄSSLE

Research Infrastructures

- 16 Instrument Design at the European Spallation Source
K.H. ANDERSEN

Muon & Neutron & Synchrotron Radiation News

- 20 The rise of X-ray Free-Electron Lasers:
Outstanding characteristics and new opportunities
M. ALTARELLI, B. EBELING

School and Meeting Reports

- 32 SoNS Neutron School visited Taormina
C. ANDREANI, S. MAGAZÙ
- 34 NMI3's Education and training activities
J. SAVIN

Call for proposal

- 36 Neutron Sources
- 37 Synchrotron Radiation Sources

Calendar

Facilities

- 41 Neutron Scattering
- 44 Synchrotron Radiation Sources
- 48 The neutron scrounger

SoNS Neutron School visited Taormina

C. ANDREANI

*Università degli Studi di Roma Tor Vergata
CNR-IPCF*

S. MAGAZÙ

Università degli Studi di Messina

The School of Neutron Scattering, <http://www.sonsfpricci.org>, named after the late Francesco Paolo Ricci, prominent scientist in neutron scattering and one of the founding fathers of the Italian neutron scattering community, has become a fix appointment of the international scientific calendar, and has steadily grown in prestige and international standing over the years. It is held every second year and provides students a comprehensive training in the fundamental concepts of neutron scattering and educates them on the utilization of major neutron facilities, in neutron scattering techniques, instrumentation and data collection, analysis and interpretation.

The XI edition, we had the privilege to co-direct, was co-funded by the Association

"School of Neutron Scattering Francesco Paolo Ricci", the CNR, Universities of Messina, Milano Bicocca and Rome Tor Vergata, NMI3 and a number of Italian institutional sponsors. It was held at the superb setting of Palazzo Duchi di S. Stefano in the town centre of splendid Taormina (Messina, I) in May 22-27 2006. This edition addressed the theme "structure and dynamics of biosystems", as investigated with a variety of neutron scattering tools. Emphasis was placed on theory and practice, with a mix of introductory lectures, specialised lectures providing the theoretical basis, scientific seminars on topical subjects.

The School started on Monday afternoon with introductory lectures on Neutron, Neutron Sources (C. Andreani, University of Rome Tor Vergata) and theory of neutron scattering (S. Magazu, University of Messina), which were followed by interesting lectures and examples on diffraction, by Silvia Capelli (ILL), who initiated the students on the intricacies of neutron diffraction. A detailed insight into neutron instrumentation at pulsed and steady sources was the subject of the lectures presented by Daniele Colognesi (CNR-ISC) and Enrico Perelli Cippo (University of Milano Bicocca). Roberto Senesi (University of Rome Tor Vergata) introduced the students to the exciting opportunities provided by the new spectroscopic techniques using eV neutrons. Yuri Gerelli (ILL) and Francesca Natali (ILL) provided extremely clear introductions to SANS & Neutron & X-ray reflectometry and QENS, respectively, with interesting results from water-air interface, peptide inclusion, lipid bilayer and proteins. Tardocchi (CNR-IFP) introduced the state-of-art of neutron and gamma detectors and Giuseppe Gorini (University of Milano Bicocca)



Luois Hennet, Marie-Louise Saboungi
and David Price

gave a fascinating lectures on i.e. the latest developments of CHIPIR and IMAT instruments under construction at the ISIS TS-2, discussing the dangers of fast neutrons to advanced electronics (how alien invaders can change governments). Gabriele Salvato (CNR-IPCF) and Dario Tresoldi (CNR-IPCF) initiated the students on the complexity of time of flight neutron imaging, with theory and tutorials. Luigi Paolasini (ESRF, CNR-ISM) gave a brilliant lecture on magnetic neutron scattering, while Luis Hennet (CNRS-CEMHTI) and Giuseppe Zaccai (ILL) fascinated the students with the unusual but extremely interesting topics of containerless techniques, for the study of liquid state, and the ecology of protein dynamics.

Margarita Russina (Helmholtz Zentrum Berlin) addressed the dynamical functionality of novel materials robed by time of flight spectroscopy while Feri Mezei (ESS) addressed the evolution of neutron beam sources and introduced the students to the ESS project. Miguel Gonzalez (ILL) gave a beautiful lecture on the computer simulation and neutron scattering tools in biophysics. One particularly valuable contribution from the Lecturers was a full set of lecture notes (available on the School web site <http://www.sonsfpricci.org>).

In addition to hard work, the School was also good fun. The unquestionable charm of the School venue helped us to lure the very best lecturers and tutors on each

topic from around the world, and this, in turn, attracted a group of highly competent and motivated Italian, European and International students. The scenic setting of Taormina was an almost irresistible distraction for the students and lectures who enjoyed unforgettable lunches and dinners together at Rosso Peperoncino and La Piazzetta restaurants, where after-dinner sessions were accompanied by good dose of Sicilian wines, granite, and sweets.



Editorial News

ESRF Upgrade Programme Reaches Halfway Mark

Scientific Reviews

Building a road map for tailoring multilayer polyelectrolyte films

J. ANKNER, A. BARDOEL, S. SUKHISHVILI

Magnetism reflectometer study shows LiF layers improve efficiency in spin valve devices

A. BARDOEL, V. LAUTER, G. SZULCZEWSKI

Magnetism in solid oxygen under pressure by neutron diffraction

S. KLOTZ, TH. HANSEN, TH. STRÄSSLE

Research Infrastructures

Instrument Design at the European Spallation Source

K.H. ANDERSEN

Muon & Neutron & Synchrotron Radiation News

The rise of X-ray Free-Electron Lasers: Outstanding characteristics and new opportunities

M. ALTARELLI, B. EBELING

School and Meeting Reports

SoNS Neutron School visited Taormina

C. ANDREANI, S. MAGAZÙ

NMI3's Education and training activities

J. SAVIN

