

INTENSE

Particle physics experiments at the high intensity frontier, from new physics to spin-offs. A cooperative Europe-US-Japan effort

WP6 Dissemination and Outreach

Chiara Vignoli

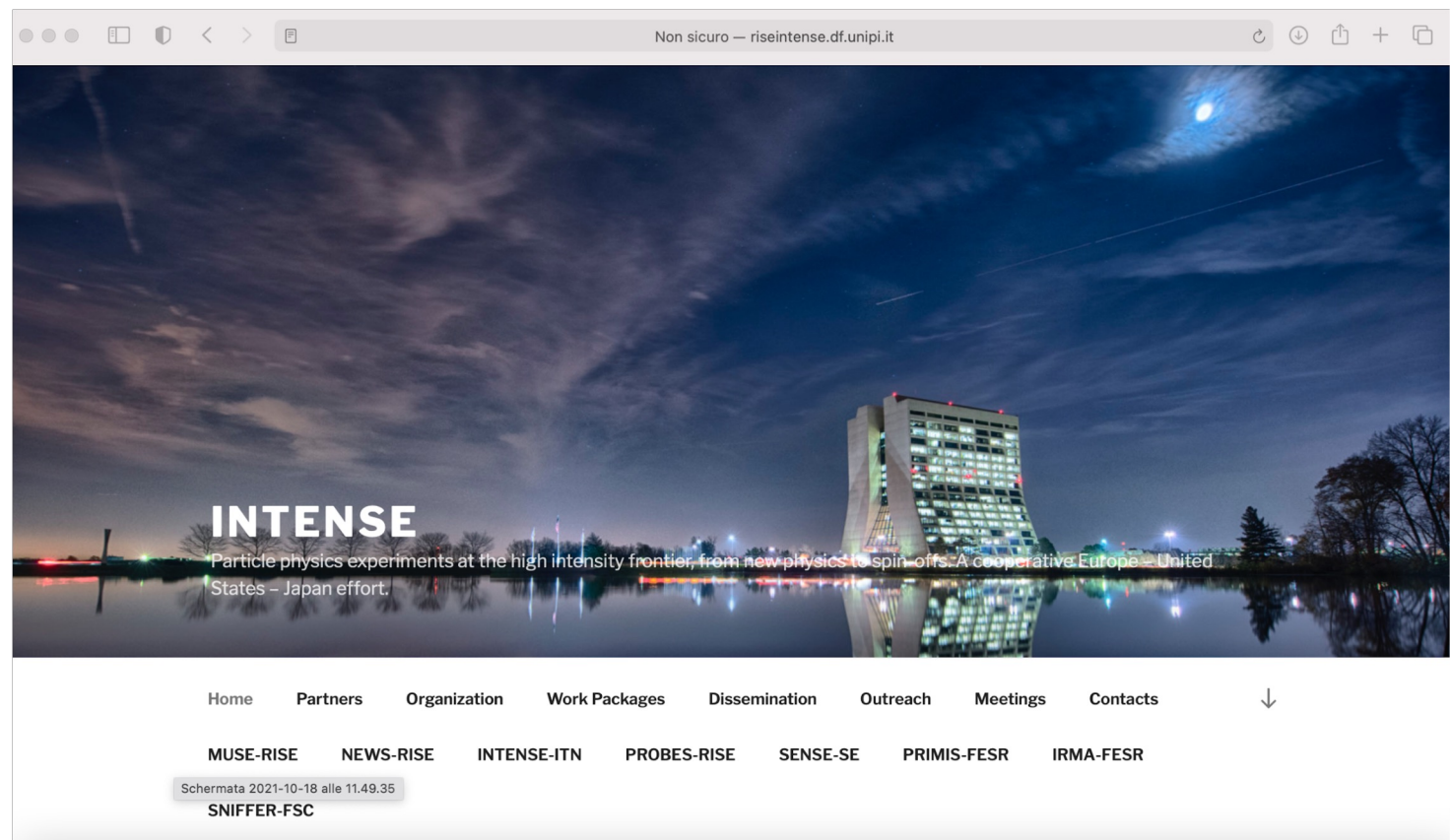
INTENSE MidTerm Review Meeting, November 28 2022



European Commission

INTENSE Web page

- <http://riseintense.df.unipi.it>
- The web site reports the relevant project information, as well as a list of scientific publications and contributions to International Conferences and Workshops



Dissemination

- There has been a wide participation in International Conferences and Workshops of the staff researchers, which included oral (Talks) and written contributions (Posters) to numerous International Conferences, and publication of articles in physics and instrumentation journals.
- In the 1.2.6 Section of the Report we include some examples of participation at Conferences and articles

Papers: ICARUS

- L. Bagby et al. *Overhaul and installation of the ICARUS-T600 liquid argon TPC electronics for the FNAL Short Baseline Neutrino program*, (2021) Journal of Instrumentation, 16 (1), art. no. P01037, DOI: 10.1088/1748-0221/16/01/P01037
- B. Ali-Mohammadzadeh et al., *Design and implementation of the new scintillation light detection system of ICARUS T600*, (2020) Journal of Instrumentation, 15 (10), art. no. T10007, DOI: 10.1088/1748-0221/15/10/T10007
- M. Antonello et al., *Study of space charge in the ICARUS T600 detector*, (2020) Journal of Instrumentation, 15 (7), art. no. P07001, DOI: 10.1088/1748-0221/15/07/P07001
- An inaugural paper of ICARUS at FNAL is near to its completion

Papers: Mu2e

- A. Gioiosa et al., "Status of the data acquisition, trigger, and slow control system of the Mu2e experiment at Fermilab, NIMA 1046 (2023), 167732
- N. Atanov et al, "Conceptual design of a Robotic Arm for the maintenance of the read-out units of the Mu2e electromagnetic calorimeter", NIMA 1046 (2023), 167733
- C. Bloise et al., "Design, assembly and operation of a Cosmic Ray tagger based on scintillators and SiPMS", NIMA 1045 (2023), 167538
- N. Chitirasreemadam et al., "Mu2e event visualization development using TEve and Eve-7", NIMA 1045 (2023), 167614
- N. Atanov et al., "Development and construction status of the Mu2e electromagnetic calorimeter mechanical structures", JINST 17 (2022) 10, C10021
- F. Abdi et al, "Mu2e Run I sensitivity projections for the neutrino $n \rightarrow e$ conversion search in aluminum", e-Print 2210.11380 [hep-ex]
- C. Bloise et al., "An automated QC station for the calibration of the Mu2e calorimeter readout units", NIMA (2023), 167811
- D. Pasciuto et al., "Development, construction and qualification tests of the Mu2e electromagnetic calorimeter mechanical structures", PoS NuFact2021 (2022) 193
- plus many more

Papers on Muography

- Atmospheric muons as an imaging tool / L. Bonechi, R. D'Alessandro, A. Giammanco, arXiv:1906.03934 [physics.ins-det]; Reviews in Physics 5 (2020) 100038;
- Muographic monitoring of hydrogeomorphic changes induced by post-eruptive lahars and erosion of Sakurajima volcano, Scientific Reports 11, 17729;
- Toward low gas consumption of muographic tracking detectors in field applications, J. of Applied Physics 129, 244901;
- Gaseous Tracking Detectors at the Sakurajima Muography Observatory TIP: International Conference on Technology and Instrumentation in Particle Physics, Online;
- Construction and readout system for gaseous muography detectors, J.Adv.Instr.Sci. 2022, 307;
- Development of Machine Learning Assisted Spectra Analyzer for the NEWCUT Muon Spectrometer, J.Adv.Instr.Sci. 2022, 264;
- Muography of the active Sakurajima volcano: recent results and future perspectives of hazard assessment, J.Adv.Instr.Sci. 2022, 285;
- Portable Resistive Plate Chambers for Muography in confined environments / R.N.I.D Gamage, InterDisciplinary Underground Science and Technology Conference (i-DUST 2022), Avignon (France), June 7-10, 2022;
- A portable muon telescope for geophysical exploration / M. Al-Moussawi; First International Meeting for Applied Geoscience & Energy (IMAGE21), Denver (USA), September 26 - October 1, 2021;
- **plus many more**

International Conferences & Workshops

Some examples

2019

- NeuTel 2019
- WIN 2019
- EPS-HEP 2019
- ICNFP 2019
- IPRD19

2020

- ICHEP 2020
- NEUTRINO 2020
- NUFACT 20|21

2021

- NeuTel 2021
- EPS-HEP 2021
- WIN 2021
- TAUP 2021
- TIPP 2021
- PANIC 2021

2022

- CALOR 2022
- ICHEP 2022
- NEUTRINO 2022
- NUFACT 2022
- NOW 2022

Due to pandemic part of the events of 2020 and 2021 were online or postponed

International Conferences & Workshops: ICARUS experiment

2019

- participation to **13 conferences/workshops**
- **16 speakers** (7 from INFN, 9 from USA ICARUS groups): 4 invited talks + 9 talks + 1 poster
- Good visibility reception of ICARUS experiment!

2020

- COVID-19 situation made several conferences to be postponed to 2021
- Anyway, good presence of ICARUS in the online conferences
- participation to **8 conferences/workshops**
- **17 speakers**: 4 invited talks + 7 talks (mostly from young collaborators) + 6 posters

2021

- despite pandemic, 2021 was a very crowded year due to many COVID-postponed conferences
- participation to **15 conferences/workshops**
- **22 speakers**: 7 invited talks + 12 talks + 8 posters

2022 (up to now)

- participation to **15 conferences/workshops**
- **31 speakers**: 5 invited talks + 19 talks + 8 posters

IPRD 2019

- 15th Topical Seminar on Innovative Particle and radiation Detectors (October 14-17 2019, Siena, Italy)
- D. Varga, "Tracking detector for high performance cosmic muon imaging"
- S. Basnet, "Towards portable muography with small-area and gas-tight Resistive Plate Chambers" (Talk)
- M. D'Errico, "Muon radiography applied to volcanoes imaging: the MURAVES experiment at Mt. Vesuvius" (Talk)
- G. Galgoczi, "Imaging by muons and their induced secondary particles - a novel technique" (Talk)



The poster for the 15th Topical Seminar on Innovative Particle and Radiation Detectors (IPRD19) is set against a light orange background. At the top, a large, faint '15TH' is visible. The title 'TOPICAL SEMINAR ON INNOVATIVE PARTICLE AND RADIATION DETECTORS (IPRD19)' is in bold orange text. Below it, the dates 'Siena, 14 - 17 October 2019' are written in a script font. The poster is divided into three main columns: International Advisory Committee, Organizing Committee, and Programme Information. The bottom right features a detailed orange line drawing of the Siena skyline, including the Palazzo Pubblico and the Duomo. At the bottom left, a list of sponsors is provided.

**15TH TOPICAL SEMINAR
ON INNOVATIVE PARTICLE
AND RADIATION DETECTORS
(IPRD19)**

Siena, 14 - 17 October 2019

INTERNATIONAL ADVISORY COMMITTEE	ORGANIZING COMMITTEE	PROGRAMME INFORMATION
E. Aprile - New York T. Camporesi - CERN S. Coutu - Penn State P. De Bernardis - Rome A. Del Guerra - Pisa U. Dosselli - Padua R. Iuppa - Trento C. Kourkouvelis - Athens P. Lecoq - CERN M. Nessi - CERN C. Nociforo - GSI M. Panasyuk - Moscow N. Pastrone - Turin E. Previtali - Milan H. Sadrozinski - Santa Cruz A. Savoy Navarro - Paris-Diderot/Pisa A. Scribano - Siena A. Seiden - Santa Cruz A. Sharma - CERN T. Tabarelli de Fatis - Milan G. Tonelli - Pisa S. Torii - Waseda S. Wakely - Chicago M.M. Weber - Karlsruhe A. Yamamoto - KEK A. Zecoli - Bologna	Pietro Govoni (INFN Milano-Bicocca) Giovanna Lehmann (CERN) Pier Simone Marrocchesi (University of Siena) Francesco-Luigi Navarria (University of Bologna) Marco Paganoni (University of Milano-Bicocca) Andrea Perrotta (INFN Bologna) Tiziano Rovelli (University of Bologna)	A. Perrotta INFN Viale C. Berti Pichat 6/2 I-40127 Bologna e-mail perrotta@bo.infn.it phone +39 051 2095140 www.bo.infn.it/sminiato/siena19.html

SPONSORSHIP

ISTITUTO NAZIONALE DI FISICA NUCLEARE
UNIVERSITA DI BOLOGNA
UNIVERSITA DI SIENA
ITALIAN PHYSICAL SOCIETY
CAEN
COSTRUZIONI APPARECCHIATURE
ELETTRONICHE NUCLEARI

WIN 2019

- International Conference on Weak Interactions and Neutrinos (June 3-8 2019, Bari, Italy)

WIN2019 3-8 June 2019, Bari (Italy)

The 27th International Workshop
on Weak Interactions and Neutrinos

Scientific Topics:
Neutrino physics
EW symmetry breaking & Higgs
Astroparticle physics
Flavor and precision physics

Website & Contact:
<http://win2019.ba.infn.it>
win2019@lists.infn.it

International Advisory Committee
Alessandro Baldini (Pisa, Italy)
Nicole Bell (Melbourne, Australia)
Olga Botner (Uppsala, Sweden)
Andrzej Buras (TUM, Germany)
Mark Chen (Queen's, Canada)
Mu-Chun Chen (University of California, USA)
Sacha Davidson (IPN de Lyon, France)
Bonnie Fleming (Yale, USA)
Maury Goodman (ANL, USA)
Xiao-Gang He (NTU, Taiwan)
Soo-Bong Kim (SNU, South Korea)
Yoshi Kuno (Osaka, Japan)
Manfred Lindner (MPI Heidelberg, Germany)
Marvin Marshak (Minnesota, USA)
Mark Messier (Indiana, USA)
Hisakazu Minakata (Virginia Tech, USA)
Masayuki Nakahata (Tokyo, Japan)
Tsuyoshi Nakaya (Kyoto, Japan)
Anja Nelson (Washington, USA)
Georg Raffelt (MPI Munich, Germany)
Pierre Ramond (Florida, USA)
Alexei Smirnov (MPI Heidelberg, Germany)
Mark Thomson (Cambridge, UK)
Raymond Volkas (Melbourne, Australia)
Yifang Wang (IHEP, China)
Henry Wong (Academia Sinica, Taiwan)
Zukanovich Funchal (USP, Brazil)

Local Organizing Committee
Gabriella Catanesi (INFN Bari, chair)
Vincenzo Berardi (Politecnico di Bari)
Elisabetta Bissaldi (Politecnico di Bari)
Francesco Cafagna (INFN Bari)
Mauro de Palma (Università di Bari)
Nicola Giglietto (Politecnico di Bari)
Eligio Lisi (INFN Bari)
Lorenzo Magaletti (Politecnico di Bari)
Antonio Marrone (Università di Bari)
Alessandra Pastore (INFN Bari)
Alexis Pompili (Università di Bari)
Emilio Radicioni (INFN Bari)

Administrative and technical support
A. Catalano (Università di Bari)
E. D'Alba (INFN Bari)
L. Napolitano (Università di Bari)
S. Nicotri (INFN Bari)
G. Salente (INFN Padova)
A. Silvestri (INFN Bari)

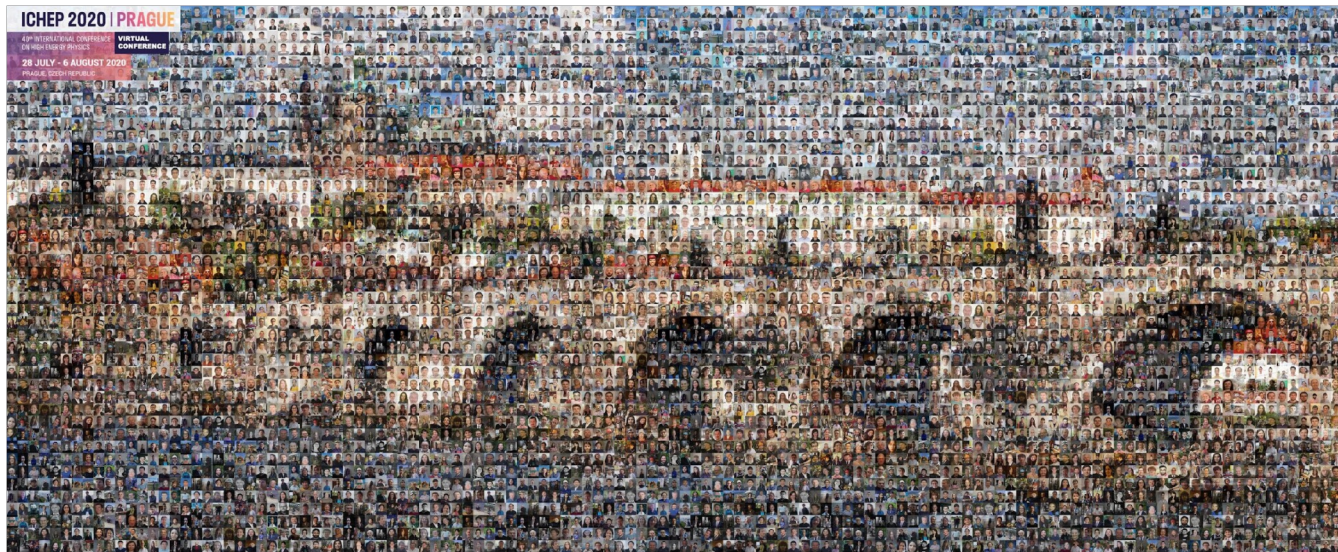
SPONSORED BY
EU project 644294 JENNIFER
CAEN Company Network
HAMAMATSU PHOTONICS OUR BUSINESS

INFN
Istituto Nazionale di Fisica Nucleare

C. Farnese (INFN Padova): "Sterile neutrino searches with the ICARUS detector" (talk)

ICHEP 2020 - online

- International Conference on High Energy Physics (August 6, 2020, Prague Czech Republic)



- S. Donati (UNIFI), "The Italian Summer Students Program at Fermilab and other US Laboratories" (Talk)
- C. Farnese (INFN Padova), "Sterile neutrino searches with the ICARUS detector" (Talk)
- O. Goodwin (UNIMAN), "Search for Heavy Neutral Leptons decaying into muon-pion pairs in the MICOBooNE Detector" (Talk)
- L. Morescalchi (INFN), "Status of the Mu2e Crystal Calorimeter" (Talk)

NeuTel 2021

- XIX International Workshop on Neutrino Telescopes (February 18-26, 2021, Padova, Italy)
- A. Fava (FNAL), "Fnal Short Baseline Neutrino Program" (Talk)
- K. Mistry (UNIMAN), "Measurement of the Electron-Neutrino Charged-Current Inclusive Cross-Section on Argon in MicroBooNE" (talk)
- P. Guzowski (UNIMAN), "Astrophysics and BSM Physics Capabilities and Results from MicroBooNE" (Talk)



Chair of Galileo, from which, according to tradition, he gave lectures - Credits: Univ. of Padova - M. Piatore

XIX International Workshop on Neutrino Telescopes

18-26 February 2021
Online

The 2021 edition of Neutrino Telescopes Workshop will focus to the original topics of the workshop: Large Detectors for Neutrino Astrophysics, Neutrino Physics and Cosmology. Opening Talks will be given by invited keynote speakers. Abstract submission for contributed and flash talks is open. Flash Talks will substitute the poster session and are purposely thought for motivated, brilliant young researchers. The conference proceedings will be published on the Zenodo platform. The Workshop will be held online on the Zoom platform. Registration is free but mandatory. The Neutrino Telescopes Workshop is organized by INFN Sezione di Padova and by the Physics and Astronomy Department of Padova University, under the patronage of the University of Padova celebrating in 2022 its 800 years of activity.

International Advisory Committee

Barry C. Barish - Caltech University
Sandhya Choubey - Harish-Chandra Research Institute, Allahabad
Takaaki Kajita - Kavli Institute for the Physics and Mathematics of the Universe, Univ. of Tokyo
Francis Halzen - Dept. of Physics, Univ. of Wisconsin, Madison
Stavros Katsanevas - European Gravitational Observatory (EGO) Consortium
Steve F. King - Univ. of Southampton, School of Physics and Astronomy
Manfred Lindner - Max-Planck-Institut für Kernphysik Heidelberg
Paolo Lipari - INFN, Roma
Eligio Lisi - INFN, Bari
Teresa Montaruli - Univ. de Geneve
Marzio Netti - CERN
Silvia Pascoli - Univ. of Durham
Serguei Petcov - SISSA and INFN-Trieste
Elisa Resconi - Technical Univ. of Munich, Germany
Alexei Yu. Smirnov - Max-Planck-Institute für Kernphysik, Heidelberg and ICTP, Trieste
Maurizio Spurio - Univ. of Bologna and INFN-Bo
Francesco Vissani - INFN-LNGS (Laboratori Nazionali Gran Sasso)

Local Organizing Committee

Mauro Mazzetto, INFN-PD (chairman)
Nicola Bartolo, Univ. of Padova - INFN-PD
Elisa Bernardini, Univ. of Padova - INFN-PD (co-chair)
Carlo Broggi, INFN-PD
Gianmaria Collazuol, Univ. of Padova - INFN-PD
Francesco D'Eramo, Univ. of Padova - INFN-PD
Christian Farnese, INFN-PD
Daniele Gabin, Univ. of Padova - INFN-PD
Marco Grassi, Univ. of Padova - INFN-PD
Alberto Guglielmi, INFN-PD
Mathieu Lamoureux, INFN-PD
Marco Laveder, Univ. of Padova - INFN-PD
Andrea Longhin, Univ. of Padova - INFN-PD
Manuela Mallamaci, Desy, Germany
Antonio Masiero, Univ. of Padova - INFN-PD
Fabio Pupilli, INFN-PD
Chiara Sirignano, Univ. of Padova - INFN-PD
Luca Stanco, INFN-PD
Filippo Varanini, INFN-PD

Secretariat

Giuseppina Salente, INFN-PD

<https://agenda.infn.it/e/Neutel2021>



graphics: ADV | INFN-PD

CPAD 2021 online

- CPAD Instrumentation Conference, Online Event (March 18-22, 2021, Stony Brook, NY)



- D. Pasciuto (UNIFI), "Development of the Mu2e Electromagnetic Calorimeter Mechanical Structures" (Talk)
- A. Gioiosa (UNIFI), "Mu2e TDAQ and Slow Control Systems" (Talk)
- F. Spinella (INFN), "Development of the Mu2e Electromagnetic Calorimeter Front-End and Readout Electronics" (Talk)

ICHEP 2022 XLI International Conference on High Energy Physics Bologna (Italy) 6-13 07 2022

THE INTERNATIONAL CONFERENCE ON HIGH ENERGY PHYSICS
ICHEP is the reference conference of particle physics where the most important recent results are presented. The ICHEP conference series is organised by the C11 commission of the International Union of Pure and Applied Physics (IUPAP) and has been held every two years in its more than 70 years lifespan. ICHEP 2022 will be the first time of a ICHEP conference to be held in Italy and falls just ten years after the Higgs boson discovery offering the occasion to celebrate this anniversary as well as to share the latest advancements in particle physics, astrophysics and cosmology, accelerator science and plans for major future facilities.

INTERNATIONAL ADVISORY COMMITTEE

H. Abramowicz (Tel Aviv Univ.)
E. Barberio (Univ. of Melbourne)
U. Bässler (IN2P3-CNRS)
L. Bellagamba (INFN)
T. Behrens (DESY)
S. Bertelsen (Nikhef)
S. Bhaumik (CERN)

Z. Dolezal (Charles Univ.)
J. Fuster (IFIC)
P. Giacomelli (INFN)
L. M. Glaser (CERN)
S. Guidice (CERN)
S. Henderson (JLAB)
M. Hryniewski (CERN)

Y.-K. Kim (FNAL)
R. Leitner (Charles Univ.)
L. Malgeri (CERN)
L. M. M. (CERN)
J. Nash (Mangsh Univ.)
C. Parkes (Univ. of Manchester)
M. Pospelov (CERN)

M. Sgroi (CEA and IN2P3, Paris)
I. Taborda (Georgia Tech)
M. Thomson (Univ. of Cambridge)
G. Todorov
P. Vahle (Univ. of William & Mary)
Y. Wang (IHEP Beijing)
M. Wiesinger (CERN)

European Physical Society

Conference on High Energy Physics

26–30 July 2021

- Astroparticle Physics and Gravitational Waves
- Cosmology
- Neutrinos and Dark Matter
- Flavour and CP Violation
- Standard Model and Beyond
- Electroweak Symmetry Breaking
- Quantum Field Theory and String Theory
- QCD and Heavy Ions
- Accelerators and Detectors
- Outreach, Education and Diversity

International Advisory Committee:

Laura Baudis (Zürich, CH), Martina Roman (Barcelona, ES),
Felix Bopp (SLAC, US), Chiara Caputo (Paris, FR),
Mauricio Carena (FNAL, US), Roberto Carlini (Padova, IT),
Lance Dixon (SLAC, US), Anne-Sophie Elie (IPHE-CEA, FR),
Pablo Garcia (CERN, CH), Christopher Gooden (DESY, DE),
Gian Giudice (CERN, CH), Francis Halzen (Madison, US),
Marc Henneaux (Bonn, DE), Peter Higgs (Liverpool, UK),
Baris Hippolyte-Sarrazin (Paris, FR), Marek Karliner (Tel Aviv, IL),
Svetlana Kabanova (DESY, DE), Eric Laenen (BNP, CH),
Ofer Lander (London, GB), Mike Laperle (CERN, CH),
Richard Ledrsky (JLAB, US), Peter Lind (DESY, DE),
Silvia Marzocchi (CERN, CH), Jacques Mounet (CERN, CH),
Gavin Newbold (JLAB, US), Raymond Peen (DESY, DE),
Giovanni Passolunghi (INFN, IT), Maria Perrotti (LIPN, FR),
Ezio Preuss (CERN, CH), Christoph Schwanda (CERN, CH),
Katsuhiko Tanihara (KEK, JP), Wang Wang (IHEP, CH),
Edoardo Zaccaria (INFN, IT), Isabelle Wingerter (Munich, FR),
Antonio Zoccolato (INFN, IT)

International Organizing Committee:

Federico Antonioli (Padova, IT), Cristian Baccus (Paris, FR),
Jürgen Dittmann (Bonn, DE), Silvia Gamba (Munich, DE),
Thomas Gaisser (Zürich, CH), Valeria Giamberini (Cambridge, GB),
Berndt Glöckle (Jülich, DE), Valeria Giamberini (Cambridge, GB),
Anna Lattuada (Bonn, DE), Fabio Maltoni (Lund, SE),
Maurizio Mazzoni (Padova, IT), Eugenio Nappi (Bari, IT),
Noah Otter (DESY, DE), Silke Otter (DESY, DE),
Daniel Schulte (CERN, CH), Geraldine Severi (DESY, DE),
Hendrik W. van der Broek (DESY, DE),
Nick van Eijndhoven (Bonn, DE), Juan Vautin (Lund, SE)



Local Organizing Committee:
Tien Behrens, Manfred Freisner, Michael Gries, Johannes Müller, Sarah Heim,
Matthias Kaspermann, Gregor Knecht, Andrea Schröder, Matthias Schröder,
Christian Schwaninger, Thomas Schirmer-Selinger, Georg Steinbrink,
Mako Takami, Gertjan Wamborn
www.eps-hep2021.eu

NEUTRINO 2020

NuFact 20|21

The 22nd International Workshop on neutrinos from accelerators



SEPT
6-11, 2021
Cagliari, Italy





University of Sussex, Brighton, 16-20 May 2022

International Advisory

Local Organisers

Alessandro Cerri

NEUTRINO 2022

XXX International Conference on Neutrino Physics and Astrophysics

Virtual Seoul May 30 (Mon) - June 4 (Sat), 2022

The 50th Anniversary



Topics

- Neutrino Oscillation
- Leptonic CP Violation
- Neutrino Mass
- Neutrinoless Double Beta Decay
- Neutrino Interactions
- Reactor Neutrinos
- Accelerator Neutrinos
- Geo Neutrinos
- Atmospheric Neutrinos
- Solar Neutrinos
- Diffuse Supernova Neutrino Background
- Astrophysical Neutrinos
- Neutrinos and Cosmology
- Sterile Neutrinos
- BSM Searches in Neutrinos
- New Neutrino Technologies
- Other Interesting Neutrino Physics

International Advisory Committee

L. Alvarez-Ruso, A. S. Barabash, L. Baudis, J. F. Beacom, C. Brofferio, J. Cao, A. Dighe, A. Giuliani, M.C. Gonzalez-Garcia, S. Goswami, R. Guenette, M. Hall Reno, M. Hartz, Y. Hayato, S.K. Kang, Y.D. Kim, P. Machado, A. Marino, A. Nucciotti, J. Ochoa-Ricoux, G. Orebi Gann, M. Pallavicini, J. Raaf, G. Ranucci, M. Sanchez, K. Scholberg, D. Sinclair, M. Törtola, F. Vissani, M. Wasko, H. Wang, Y. Wong, E. Worcester, R. Zukanovich Funchal

International Neutrino Commission

J. Adams, S. Bludman, T. Bowles, S. Brice, A. Dar, G. Drexlin, G. Feldman, E. Fiorini, F. Haizen, C. Jarlskog, E. Kearns, T. Kitagaki, K. Kleinknecht, T. Kobayashi, J.G. Learned, M. Lindner, K. Long, V. Louis, M. Marshak, A. B. McDonald, M. Nakahata, T. Nakaya, V. Palladino, S. Parke, S. Pascoli, H. Pietschmann, M. Roos, N. Schmitz, J. Schneps, Y. Suzuki, F. Vannucci, D. Vongpauk, F. von Feilitzsch, S. Zeller

Local Organizing Committee

Myung Ki Cheon (Seoul), Kihyeon Cho (KIST), Eun-Jin Cho (KIAS), Jungwhan Goh (Kjuehyeu U), Sang Hyeon Jang (IBS), Kwanghyuk Joo (Chonnam U),
 Sn Kyu Kang (Seoul Tech), Dorte Kim (Seoul U), Honggi Kim (Kyungju U), Hyunsu Kim (Sogang U), Sang-Chul Kim (KIAS), Siyeon Kim (Chung Ang U), Jeongmin Kim (Hanyang U),
 Myung-Jae Lee (Sungkyunkwan U), Tongseok Oh (Kyungju U), Yoonin Oh (IBS), Myeong-Yeol Park (Jeonju U), Inkyu Park (U of Seoul), Jong-Chul Park (Chonnam U),
 Seung Chan Park (Narae U), Donghu Park (UNIST), Sunny Seo (SJK), Co-Chair,
 Heonwoo Yoo (Yonsei U), Gangye Yoo (SNU), Seung-Sik Yoon (KIST), Seung-Sun Jeon (Seoul U), Jeonghyeon Song (Konkuk U), Byongsun Yang (SNU), Un-Ki Yang (Seoul U)

NEUTRINO 2022 Secretariat office@neutrino2022.org
Website www.neutrino2022.org



The APCTP is supported by the Korean Government through the Science and Technology Promotion Fund and Lottery Fund and strives to maximize social value through its various activities.



Antonio Masiero INFN, Italy
António Onofre LIP, Portugal
Barbara Jacak Berkeley, USA
Bingsong Zou ITP, China
Conceição Abreu LIP, Portugal
Fiabola Gianotti CERN, Switzerland
Giora Mikenberg Weizmann, Israel
Isabel Lopes LIP, Portugal
Jianwei Qiu JLAB, USA
Joachim Mnich DESY, Germany
Jorge Romão CFTF, Portugal

Jorgen D'Hondt *ECFA, Belgium*
Klaus Peters *GSI, Germany*
Mário Pimenta *LIP, Portugal*
Martine Bosman *IFAE, Barcelona, Spain*
Masanori Yamauchi *KEK, Japan*
Matthias Kasermann *DESY, Germany*
Nu Xu *CCNU, China*
Paolo Giubellino *GSI, Germany*
Patrice Verdier *IN2P3, France*
Patricia McBride *FNAL, USA*
Paua Eerola *U. of Helsinki, Finland*
Dhileep Chandra *CEA, France*

Reiner Krücken TRIUMF/UBC, Canada
Reinhard Beck U. Bonn, Germany
Richard Milner MIT, USA
Robert D. McKee JLAB, USA
Rolf-Dieter Heuer DPG, Germany
Soo-Bong Kim SNU, Korea
Stephan Paul TU Munich, Germany
Torsten Akeström U. Lund, Sweden
Victor Matveev JINR Dubna, Russia
Xiangdong Ji SJTU, China
Yifang Wang IHEP, China
Yonggang Zhao KIOF, U. of Chongqing, PR

Agostinho Gomes **LIP / FCUL**
Alexandre Lindote **LIP**
Amélia Maio **LIP / FCUL**
Ana Sofia Nunes **LIP / BNL**
Catarina Espírito Santo **LIP**
Daniel Galaviz **LIP / FCUL**
José Augusto **LIP / FCUL**
João Gentil Saraiva **LIP**
Helena Santos **LIP / FCUL** Chair

Liliana Apolinário **LIP /**
Lorenzo Cazon **LIP**
Luís Peralta **LIP / FCUL**
Marcin Stolarski **LIP**
Nuno Barros **LIP / FCUL**
Nuno Castro **LIP / UMa**
Ricardo Gonçalves **LIP / F**
Rute Piedro **LIP**
Valentina Lozza **LIP / F**

PANIC Lisbon Portuga

Particles and Nuclei International Conference

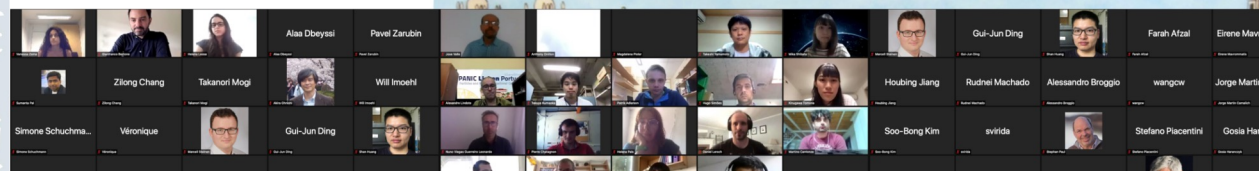
05 — 10 SEP ————— 2021

- **Hot and dense matter physics**
QGP and heavy ion collisions
- **QCD, spin physics**
and chiral dynamics
- **Hadron spectroscopy**
and exotics
- **Neutrino physics**
- **Dark matter and cosmology**
- **Nuclear and particle**
astrophysics
- **Standard model physics**
at the TeV scale
- **Energy frontier physics**
beyond the standard model
- **Flavor physics**
CKM and beyond
- **Tests of symmetries**
and conservation laws
- **Hadrons in medium**
Hyperons and mesons
in nuclear matter
- **Development of accelerators**
and detectors

22nd edition

PANIC Lisbon Portugal

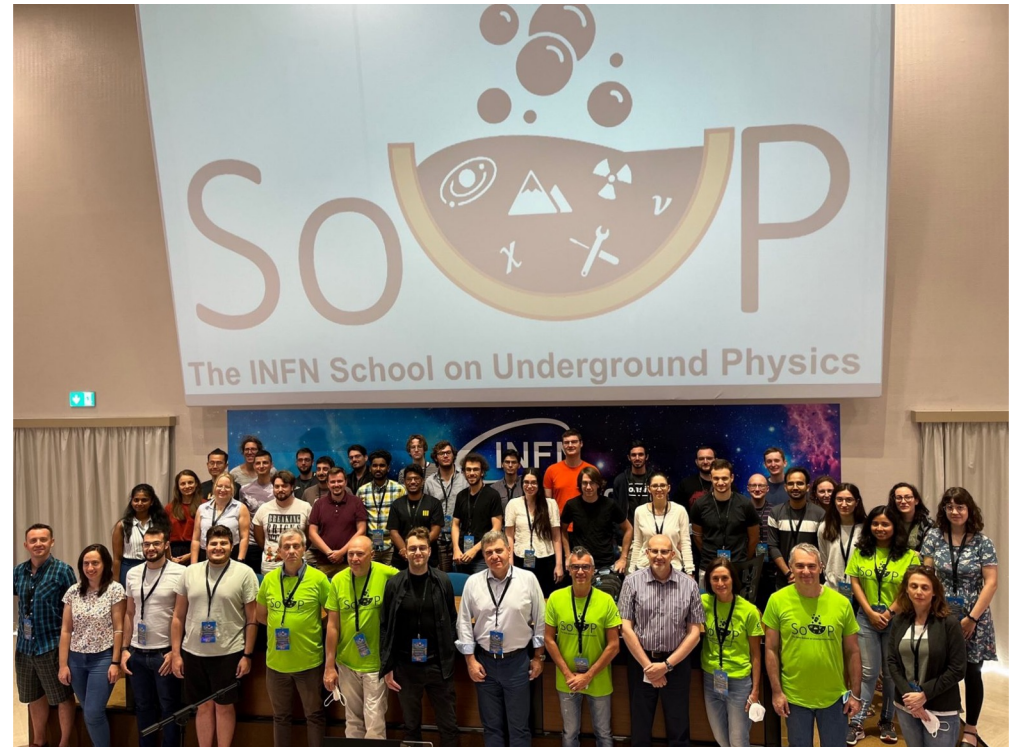
Particles and Nuclei International Conference



SOUP International School



- First 2 editions: 2021, 2022
- Advanced school for PhD students, post-docs and young researchers on underground physics:
 - Neutrinos: theory and experiments
 - Experiments (ICARUS; SBN Project; DUNE)
 - Detectors & Instrumentation



Outreach Activity :

European Researchers' Night - September 27, 2019

November 27, 2020 online

September 24, 2021

September 30, 2022

The event aims to bring researchers closer to the general public and to increase public awareness of research and innovation activities with a view to supporting the public recognition of research and innovation activities, creating an understanding of the impact of researchers' work on citizens' daily lives and encouraging young people to embark on research careers

- Plenty of events across Europe:

- also funded by other EU projects: SHARPER - GA 818977, BRIGHT - GA 818515
- INFN, UNIPD and INGV researchers contributed to organize events in several Italian cities
- As an example we present here some events that took place in Italy
 - SHARPER
 - VENETO NIGHT

Outreach Activity:

European Researchers' Night 2019, 2020, 2021, 2022

- SHARPER is an event across Italy
 - H2020-MSCA-NIGHT2018
 - H2020-MSCA-NIGHT2020
 - H2020-MSCA-NIGHT2022
- Presentation of INTENSE activities



@ SHARPER L'Aquila

- Interviews on TV and radio
- Seminars to general public
- Shows on neutrino
- Posters on neutrino
- Games with kids on neutrino
- Games for general public
- Experiments description
- Particle models
- Detector models
- Physics research impact in life and technology

Outreach Activity: European Researchers' Night - September 27, 2019

- Posters on neutrino
- Games with kids on neutrinos
@ SHARPER L'Aquila



C. Vignoli (INTENSE – LNGS)

Il Neutrino

ELEMENTARE

E' un mattone fondamentale della materia: non è composta da altre particelle. La sua esistenza è stata postulata da Pauli nel 1930. E' stato poi scoperto nel 1956 da Cowan & Reines.

LEGGERO

Ha una massa molto piccola: circa 1 milionesimo più piccola di quella di un elettrone e 1 miliardesimo di quella del neutrone.

VELOCE

Pur avendo massa, il neutrino viaggia quasi alla velocità della luce (che è la velocità del fotone).

NEUTRO

E' privo di carica elettrica: non risente della carica positiva dei protoni né quella negativa degli elettroni.

SCHIVO

Interagisce poco con la materia, quindi è molto difficile da rivelare. Risente solo delle forze deboli (oltre alla gravità). La Terra stessa è praticamente trasparente per i neutrini. Ci vorrebbero 1000 anni luce di acqua per fermare un neutrino!

ABBONDANTE

L'universo è pieno di neutrini. Sono prodotti da vari fenomeni come le reazioni nucleari nelle stelle e in particolare nel Sole e i decadimenti di particelle nella Terra (che producono i "geo-neutrini"). Ogni secondo la punta del nostro dito è attraversata da 65 miliardi di neutrini solari! Il neutrino può essere prodotto anche artificialmente negli acceleratori di particelle, come quelli del CERN e del FERMI LAB.

MULTIFORME

Ci sono almeno 3 tipi di neutrini, forse anche 4. I tre neutrini si chiamano elettronico, muonico e tauonico. Il quarto neutrino (detto "sterile"), se esiste, è ancora meno facile da rivelare!

CAMALEONTICO







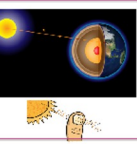



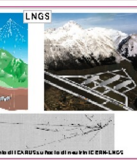
Il neutrino si trasforma durante il suo cammino. Questo fenomeno è conosciuto come le "oscillazioni" del neutrino.

MISTERIOSO

Il dilemma del neutrino e della sua antiparticella, l'antineutrino, sono la stessa particella, come ipotizzato da Majorana, o particelle diverse, come previsto da Dirac? Questo si può scoprire studiando i decadimenti doppi beta.

INAFERRABILE

Per studiare i neutrini si devono costruire rivelatori sofisticati e limitare il disturbo dei raggi cosmici. Ai Laboratori Nazionali del Gran Sasso dell'INFN si studiano i neutrini sotto 1400 metri di roccia! Oltre che sotto terra, gli esperimenti sui neutrini si conducono sotto il mare e sotto il ghiaccio. Ci sono inoltre esperimenti su fasci di neutrini prodotti artificialmente da acceleratori di particelle.



Outreach Activity:

European Researchers' Night - 2020 and 2021



27.11.2020
venetonightpadova.it
Researchers' Night

Questa particella, proveniente dall'atmosfera, e' interessante?

▲ No, ICARUS ne raccoglie moltissime ◆ No, perche' non si sa che particella sia

● Si, perche' e' un muone ■ Si, perche' e' un neutrino

ICARUS at the European researchers' night in Padova

- The ICARUS younger researchers organized online activities in 2020 and 2021 editions
- A "virtual" tour via zoom of the ICARUS detector @ FNAL was organized both in 2020 and 2021
- An online virtual game "Recognize the particle in ICARUS" was organized in 2020, showing tracks of particles in the events recorded by the ICARUS detector during the run at the Gran Sasso Lab

C. Farese (INTENSE – INFN Padova)

Further Outreach Activities :

- Summer School "Summer Students at FNAL and other US Laboratories" (see next talk)
- CERN open access to LHC facilities (with the contribution of Clever)
- Researchers involved in Muography made several outreach activities, as examples:
 - UCL organized "Printemps des Sciences" for high schools with a small muon telescope developed on purpose as part of Muography initiatives
 - UBERN researchers appeared on the TV program "Superquark" in July 2019 in a report dedicated to muon imaging of Swiss glaciers
- Outreach articles authored by INTENSE members, as an example in 2019:
 - A. Giammanco (UCL), CMS technology used to develop a new portable muon telescope, published on CMS News;
 - [A "muoscope" with CMS technology](#), published on CERN News;
 - [The Muoscope: a pocket muon detector with CMS technology](#), published on the Italian Physics Society News;
 - [RPCs in the wild](#), published on Newslines;
 - [Scientist Interview: Andrea Giammanco and Sophie Wuyckens](#), published on the "Muographix" web site (muographix.u-tokyo.ac.jp);