4th SUMMER SCHOOL on Neutron Detectors and Related Applications NDRA-2022

30th June – 4th July, 2022.
Riva del Garda, Trento, Italy.

Continuing in its tradition, the aim of the school is to illustrate principles, methodologies and most recent applications of neutron detection technologies. In particular, the school will tackle various arguments that span from neutron interaction principles, materials for neutrons detectors, neutron sources, Monte Carlo simulation codes, up to applications with neutrons.

The school is addressed to PhD students, Post-Docs and young researchers with backgrounds in Engineering and Physics.

TOPICS

- Neutron interaction with materials.
- Physics of neutron detectors.
- Materials for neutron detection.
- Monte Carlo simulation.
- Gas detectors for neutrons.
- Neutron sources.
- Neutrons in medicine, energy and environment.

LECTURERS

Jason Hayward (*University of Tennessee, USA*)
- Physics of neutron interaction with materials.

Stanislav Pospisil (*Czech Technical University in Prague, Czech Republic*)
- Position sensitive semiconductor detectors.

Paul Schotanus (*Scionix, Netherlands*)
- Inorganic Scintillators for Neutron Detection.

Peter Schillebeeckx (*EC-JRC-IRMM, Belgium*)
- Data analysis in neutron detection

Gregor Kramberger (*Josef Stefan Institute, Ljubljana, Slovenia*)
- Solid state neutron detectors.

Richard Hall-Wilton (*European Spallation Source, Lund, Sweden*)
- Neutron sources.

Sara Pozzi (*University of Michigan, USA)*
- Neutron Detection for Nonproliferation Applications

Alfredo Ferrari (*Karlsruher Institut für Technologie, Germany*)
- Monte Carlo methods.

Sandra Moretto (*University of Padova, Italy)*
- Environmental Neutron Detection.

Ralf Engels (*Forschungszentrum Jülich, Germany*)
- Detector design.

Bruno Guerard (*Institute Laue-Langevin, France*)
- Gas detectors.

Frederico Garrido (*Université Paris Sud, France*)
- Neutrons and nuclear waste materials.

Silva Bortolussi (*University of Pavia, Italy*)
- Neutrons for cancer therapy.

Petr Burian (*University of West Bohemia in Pilsen, Czech Republic*)
- Design of readout systems for pixel detectors.

Benedikt Bergmann (*Czech Technical University in Prague, Czech Republic*)
- Application of the Time-of-Flight technique for study of neutron interactions on semiconductors.

ORGANIZING COMMITTEE

Lucio Pancheri – Lucio.Pancheri@unitn.it
Department of Industrial Engineering, University of Trento and INFN-TIFPA, Trento, Italy
Alberto Quaranta Alberto.Quaranta@unitn.it
Department of Industrial Engineering, University of Trento and INFN-TIFPA, Trento, Italy
Gian-Franco Dalla Betta - Gianfranco.Dallabetta@unitn.it
Department of Industrial Engineering, University of Trento and INFN-TIFPA, Trento, Italy **Gian-Lina Quintieri** – lina.quintieri@stfc.ac.uk

FEES

Senior researchers	Before 1st June 450 €	After 1st June 500 €
Students	Before 1st June 350 €	After 1st June 400 €

A maximum of 60 registrations will be accepted. People who intend to join the school can preliminarily contact the organizing committee.

POSTER AND ORAL PRESENTATIONS
PhD and Post-Doc students are invited to present a poster for a dedicated session.

HOW TO REACH RIVA DEL GARDA

Motorway
A22, Brennero motorway, Rovereto sud exit: 15 minutes from the toll booth.
By coach
Direct links from Trento and Rovereto (Trentino Trasporti buses); from Verona and Desenzano (A.P.T.V. buses); from Brescia and Milan (S.I.A. buses).
By plane
- Verona Airport "Valerio Catullo" (recommended)
- Brescia Airport "Gabriele D'Annunzio"
- Bergamo Airport "Orio al Serio"
- Milano Airports "Malpensa" and "Linate"
- Venezia Airport "Marco Polo"

By train
Nearest station is Rovereto (Brennero line) 20 km from Riva del Garda.

Summer School on Neutron Detectors and Related Applications: NDRA-2022

Riva del Garda 30th – 4th July 2022

DRAFT PROGRAM

Thursday, 30th June	
16.00-20.00	Registration and welcome meeting.
Friday, 1st July	
8.30-9.30	Opening
9.30-10.30	Jason Hayward (University of Tennessee and ORNL, USA) <u>Neutron Interaction with Matter: Basics for Neutron Detection.</u>
10.30-11.00	*Coffee Break*
11.00-12.00	Jason Hayward (University of Tennessee and ORNL, USA) <u>Neutron Interaction with Matter: Basics for Neutron Detection.</u>
12.00-13.00	Petr Burian (*University of West Bohemia in Pilsen, Czech Republic*) <u>Design of readout systems for pixel detectors.</u>
13.00-14.00	*Lunch*
14.00-15.00	Sandra Moretto (*University of Padova, Italy*) <u>Environmental Neutron Detection.</u>
15.00-16.00	Paul Schotanus (*Scionix-Nederlands*) <u>Organic and inorganic scintillators for Neutron Detection.</u>
16.00-17.00	Paul Schotanus (*Scionix-Nederlands*) <u>Organic and inorganic scintillators for Neutron Detection.</u>
Saturday, 2nd July	
8.30-9.30	Ralf Engels (*Forschungszentrum Jülich, Germany*) <u>Design of Scintillator Detectors for neutrons.</u>
9.30-10.30	Ralf Engels (*Forschungszentrum Jülich, Germany*) <u>Design of Scintillator Detectors for neutrons.</u>
10.30-11.00	*Coffee Break*
11.00-12.00	Alfredo Ferrari (*Karlsruher Institut für Technologie, Germany*) <u>Monte Carlo Principles for Neutron Experiments.</u>
12.00-13.00	Alfredo Ferrari (*Karlsruher Institut für Technologie, Germany*) <u>Monte Carlo Principles for Neutron Experiments.</u>
13.00-14.00	*Lunch*

Saturday afternoon	**INDUSTRIAL DAY** – sponsored by ChETEC-INFRA EU project
14.00-15.00	Gregor Kramberger (*Josef Stefan Institute, Ljubljana, Slovenia*) <u>Principles of Semiconductor Detectors.</u>
15.00-16.00	Gregor Kramberger (*Josef Stefan Institute, Ljubljana, Slovenia*) <u>Principles of Semiconductor Detectors.</u>
16.00-17.00	*Coffee Break + Poster session*
17.00-19.00	Industrial presentations (t.b.d).
19.30	**SOCIAL DINNER (departure from Congress Center by bus)**
Sunday, 3rd July	
8.30-9.30	Bruno Guerard (*Institute Laue-Langevin, France*) <u>Gas Detectors for Neutrons.</u>
9.30-10.30	Bruno Guerard (*Institute Laue-Langevin, France*) <u>Gas Detectors for Neutrons.</u>
10.30-11.00	*Coffee Break*
11.00-12.00	Peter Schillebeeckx (*EC-JRC-IRMM, Belgium*) <u>Design and Analysis in Neutron Resonance Experiments.</u>
12.00-13.00	Peter Schillebeeckx (*EC-JRC-IRMM, Belgium*) <u>Design and Analysis in Neutron Resonance Experiments.</u>
13.00-14.00	*Lunch*
14.00-15.00	Richard Hall-Wilton (*European Spallation Source, Lund, Sweden*) <u>Neutron Sources.</u>
15.00-16.00	Richard Hall-Wilton (*European Spallation Source, Lund, Sweden*) <u>Detectors for Spallation Sources.</u>
16.00-17.00	Benedikt Bergmann (*Czech Technical University in Prague, Czech Republic*) <u>Application of the Time-of-Flight technique for study of neutron interactions on semiconductors.</u>
Monday, 4th July	
8.30-9.30	Stanislav Pospisil (*Czech Technical University in Prague, Czech Republic*) <u>New trends in development and utilization of semiconductor position-sensitive neutron detectors.</u>
9.30-10.30	Frèderico Garrido (*Universitè Paris Sud*) <u>Neutrons from nuclear waste materials.</u>
10.30-11.00	*Coffee Break*
11.00-12.00	Silva Bortolussi (*University of Pavia, Italy*)

	Neutrons for cancer therapy.
12.00-13.00	Sara Pozzi (*University of Michigan - US*)
	Neutron Detection for Nonproliferation Applications.
13.00-14.00	*Lunch and closing*