COURSE 207:
ADVANCES IN THERMOELECTRICITY
Foundational Issues, Materials, and Nanotechnology

Varenna (Italy), July 15—20 2019

The course aims to provide participants with a modern vision of the physics of thermoelectric phenomena. Moving from the thermodynamics of thermoelectricity and from the physics of transport processes, the course will offer attendants a path showing how materials structure and nanostructure, along with defects, have been used to tailor the properties of advanced thermoelectrics. Special attention will be placed on hot research topics – from spin-caloritronics to charge transport in polymers – and to a selected number of applications for heat recovery as well.
The Enrico Fermi Schools are a highly prestigious series of summer schools of the Italian Physical Society with a tradition of more than 60 years and with many Nobel laureates as lecturers.

The course will be a major occasion for young scientists to learn novel concepts in heat and charge transport physics, and will also provide junior scientists with a non-physics background an introduction to the most advanced theories and the most recent results in thermoelectricity.

Applications and Registrations
The fees to attend the course are 900€ and include school boarding, proceedings, lodging and meals in Varenna. The number of students will be limited to 80, so participants will be selected among the applicants in view of their background and motivations. A limited number of scholarships will be available to support some of the participants.

Application forms and details on the application procedure and on how to request a scholarship are available at [https://sites.google.com/unimib.it/varenna-te2019/registrations](https://sites.google.com/unimib.it/varenna-te2019/registrations)

Important dates
- 24/04/2019: Deadline for application
- 14/06/2019: Communication of acceptance
- 14/07/2019: Arrival in Varenna, Italy

The Lecturers
- G. Benenti, University of Insubria, Italy
- C. Fanciulli, CNR—ICMATE, Italy
- F. Gascoin, CRISMAT—ENSICAEN, France
- Y. Grin, Max Planck Institute, Germany
- J. Heremans, Ohio State University, USA
- K. Koumoto, Nagoya University, Japan
- B. Lorenzi, MIT, USA & University of Milano Bicocca, Italy
- D. Narducci, University of Milano Bicocca, Italy
- N. Neophytou, University of Warwick, UK
- R. Rurali, Institut de Ciència de Materials de Barcelona, Spain
- H. Sirringhaus, University of Cambridge, UK
- G. J. Snyder, Northwestern University, USA

The Program

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<thead>
<tr>
<th>Monday, 15 July</th>
<th>Tuesday, 16 July</th>
<th>Wednesday, 17 July</th>
<th>Thursday, 18 July</th>
<th>Friday, 19 July</th>
<th>Saturday, 20 July</th>
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</thead>
<tbody>
<tr>
<td>09:00 – 10:00</td>
<td>Thermodynamics of Thermoelectricity</td>
<td>Heat transport in solids</td>
<td>Inorganic-Organic Intercalation Compounds</td>
<td>Thermolectricity at the nanoscale</td>
<td>Charge and Heat Transport in Organics</td>
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<tr>
<td>10:00 – 11:00</td>
<td>Thermodynamics of Thermoelectricity</td>
<td>Heat transport in solids</td>
<td>Inorganic-Organic Intercalation Compounds</td>
<td>Thermolectricity at the nanoscale</td>
<td>Charge and Heat Transport in Organics</td>
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<td>11:00 – 11:30</td>
<td>Coffee break</td>
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<tr>
<td>11:30 – 12:30</td>
<td>Thermodynamics of Thermoelectricity</td>
<td>Heat transport in solids</td>
<td>Chalcogenides</td>
<td>Thermolectricity at the nanoscale</td>
<td>Heat conversion in hybrid solar harvesters</td>
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<td>14:30 – 15:30</td>
<td>Physics of thermoelectric phenomena</td>
<td>Novel Inorganic Materials</td>
<td>Silicon and silicides</td>
<td>Computational Design of Thermoelectrics</td>
<td>Spin-caloritronics</td>
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<td>15:30 – 16:30</td>
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<td>Silicon and silicides</td>
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<td>Spin-caloritronics</td>
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<tr>
<td>16:30 – 17:30</td>
<td>Physics of thermoelectric phenomena</td>
<td>Novel Inorganic Materials</td>
<td>EXCURSION</td>
<td>Computational Design of Thermoelectrics</td>
<td>Spin-caloritronics</td>
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<td>17:30 – 18:30</td>
<td>Design of thermoelectric harvesters</td>
<td>EXCURSION</td>
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School Board

Directors: G. Jeffrey Snyder, Northwestern University, USA
Dario Narducci, University of Milano Bicocca, Italy

Scientific secretary: Carlo Fanciulli, CNR-ICMATE, Italy
E-mail contact: varenna.te2019@gmail.com

COURSE WEBSITE

http://sites.google.com/unimib.it/varenna-te2019