The Abdus Salam International Centre for Theoretical Physics

IAEA International Atomic Energy Agency

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Joint ICTP-IAEA Fusion Energy School

DESCRIPTION:

Participants will attend a two-week specialised school on fusion energy, featuring lectures delivered by leading experts from academia, major research laboratories and the emerging private sector. The aim of the school is to broaden the knowledge of postgraduate and postdoctoral researchers in fusion science and technology, while providing valuable networking opportunities with world-class researchers.

MORE INFORMATION:

This is an exciting time to be involved in fusion energy research and development. The field is entering an unprecedented era, with several large-scale facilities around the world striving to achieve the crucial milestone of net energy gain.

To sustain fusion reactions, fuel must be heated to temperatures of around 100 million degrees. At these extreme conditions, hydrogenic fuel forms a charged-particle plasma, introducing unique challenges in confinement, stability, and control. Over the past decade, major technological advances, including testing of improved first-wall materials, power handling design, progress in deuterium-tritium operation, high-energy laser systems, powerful superconducting magnets and computational performance, have enabled significant breakthroughs on the pathway to fusion conditions. Although complicated challenges remain, the prospect of practical fusion energy is closer than ever before.

During the programme, participants will receive comprehensive introductions to key fusion topics, including theoretical, computational and experimental plasma physics, as well as overviews of cutting-edge research and technology developments presented by leading international physicists and engineers. The Fusion Energy School offers an exceptional opportunity to engage with this fast-moving and transformative topic, experts working in field and explore career pathways.

Foundations of Fusion Plasma Physics

- Introduction to Plasma Physics
- Magnetic Confinement Fusion
- Inertial Confinement Fusion
- MHD and Kinetic Theory
- Plasma Transport and Confinement
- Atomic physics for fusion plasmas

Advanced Research Themes

- Heating and Current Drive
- Plasma Turbulence and Statistical Theory
- Exhaust and Plasma Wall Interactions
- Fuel Cycle, Tritium Breeding and Blanket Technology
- ML for Fusion Plasma Control and Disruption Mitigation
- Cutting-edge Diagnostic Techniques

Societal, Industrial and Career Themes

- Safety, Regulation and Licensing Frameworks
- Fusion Industry Landscape and the Start-up Ecosystem
- Participant Flash Talks
- Careers Panel

11 - 22 May 2026

Trieste, Italy

Deadline:
1 February 2026

DIRECTORS:

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FURTHER INFORMATION:

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Female scientists are encouraged to apply.

GRANTS:

A limited number of grants are available to support the attendance of selected participants, with priority given to participants from developing countries.
There is no registration fee.

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