

Joint Varenna–Lausanne International Workshop
Theory of Fusion Plasmas 2026
21–25 September 2026 · Villa Monastero, Varenna, Italy

Monday, 21 September 2026

Session 1: Fundamental Theory of Turbulence and Transport

Chair: Per Helander

- 09:00–09:10** Welcome — J.P. Graves and P. Helander
- 09:10–09:55** **I1** A. Schekochihin — Tutorial: “As simple as possible but not simpler”: physics of turbulence and transport in fusion plasmas via reduced fluid models
- 09:55–10:40** **I2** G. O. Acton et al. — Computational and Theoretical Advances for Zonal Flows in Stellarators
- 10:40–11:10** Coffee break
- 11:10–11:55** **I7** K. Zhang et al. — Exploring Tokamak Boundary Turbulence with GRILLIX Simulations: From L-Mode to H-Mode and the Quasi-Continuous Exhaust Regime
- 11:55–12:40** **I4** P. J. Costello et al. — Constrained optimal modes: tightening thermodynamic bounds on the linear growth rate of microinstabilities
- 12:40–12:50** Group photo (Villa Monastero garden)
- 12:50–15:00** Lunch

Session 2: Tokamak Plasma Regimes

Chair: Justin Ball

- 15:00–15:45** **I5** N. Rivals et al. — Understanding of the X-Point Radiator regimes in tokamaks through an example in the WEST device
- 15:45–16:30** **I6** F. Maiden et al. — The theory behind solenoid-free microwave driven start-up in tokamaks
- 16:30–17:00** Coffee break
- 17:00–17:45** **I3** J. W. Burby — Statistical equilibrium model for stellarators
- 19:30** Welcome Party (Blanco Lounge Bar, Varenna)

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Tuesday, 22 September 2026

Session 3: Fast Ions, Runaways and Heat Transport in Stellarators

Chair: Christoph Slaby

- 09:00–09:45** **I8** *T. E. Foster et al.* — Analytical formulas for alpha-particle orbits in stellarators
- 09:45–10:30** **I9** *M. Fitzgerald* — Conservation and destruction of alpha particle invariants in optimized stellarators
- 10:30–11:00** *Coffee break*
- 11:00–11:45** **I10** *I. Ekmark et al.* — Runaway electrons in stellarators: Unlikely or unavoidable
- 11:45–12:30** **I11** *H. Thienpondt et al.* — Nonlinear critical gradients in W7-X: Insights from massive gyrokinetic simulations and experimental measurements of turbulent heat transport
- 12:30–14:30** *Lunch*

Posters

- 14:30–16:00** *Poster session 1: P1 – P13*
- 16:00–16:30** *Coffee break*
- 16:30–18:00** *Poster session 2: P14 – P26*

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Wednesday, 23 September 2026

Session 4: Microturbulent Transport and Gyrokinetics in Tokamaks

Chair: Stephan Brunner

- 09:00–09:45** **I12** *Haomin Sun et al.* — The unusual dynamics of turbulent transport in spherical tokamaks with large field line pitch angle
- 09:45–10:30** **I13** *L. De Gianni et al.* — Understanding Trapped Electron Modes in negative triangularity
- 10:30–11:15** **I14** *S. Y. Liu et al.* — Development of the Gyrokinetic-MHD Hybrid Code cuGMEC and Its Nonlinear Simulations of Alpha Particle-driven Alfvén Eigenmodes in ITER
- 11:15–11:35** *Coffee break*
- 11:35–12:20** **I15** *S. Choudhary et al.* — Gyrokinetic Transport in flat-Temperature Tokamak Plasmas
- 12:20–13:05** **I16** *J. McClenaghan et al.* — Integrating Gyrokinetic Flux Predictions with Ideal MHD Stability Boundaries
- 13:05** *Lunch*
- 19:30** *Conference dinner (Ristorante La Brega, Lierna)*

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Thursday, 24 September 2026

Session 5: Stellarator Optimisation

Chair: Stuart Hudson

- 09:00–09:45** **I17** *J. L. Velasco et al.* — Tutorial: New avenues for stellarator design enabled by piecewise omnigenity
- 09:45–10:30** **I18** *W. Sengupta et al.* — Periodic Korteweg-de Vries soliton potentials generate quasisymmetric magnetic field strength in both vacuum and finite plasma-beta equilibrium
- 10:30–11:00** *Coffee break*
- 11:00–11:45** **I19** *A. Goodman et al.* — Searching for SQulDs: Developments in the optimisation of Stable Quasi-Isodynamic Designs
- 11:45–12:30** **I20** *P. Jurašić et al.* — Designing stellarator island divertors by controlling the island flux
- 12:30–14:30** *Lunch*

Posters

- 14:30–16:00** *Poster session 3: P27 – P39*
- 16:00–16:30** *Coffee break*
- 16:30–18:00** *Poster session 4: P40 – P51*

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Friday, 25 September 2026

Session 6: Fast Ion and Nonlinear Physics in Tokamaks

Chair: Fulvio Zonca

- 09:00–09:45** **I21** *Huishan Cai* — Cross-scale Interaction between Microturbulence and Fishbone in Fusion Plasmas
- 09:45–10:30** **I22** *D. Korger et al.* — A nonlinear Schrödinger equation for the description of geodesic-acoustic-modes in tokamaks
- 10:30–11:00** *Coffee break*
- 11:00–11:45** **I23** *J. Wang et al.* — Comprehensive simulations of bursting shear Alfvén waves in tokamaks and their control via phase space engineering with ICRF waves
- 11:45–12:30** **I24** *E. G. Devin et al.* — Nonlinear evolution of strongly driven perturbative kinetic instabilities
- 12:30–12:45** *Closing session*