| PhD | |
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| **Focus** | **Topic** |
| Plasma fuelling | Continuation of pellet physics, modelling with HP12 code |
| Plasma control | Digital Twin framework: Optimize real-time plasma control usung machine learning techniques, discharge planning through predictive modeling and scenario analysis |
| Fast plasma density evaluation | QMI: FPGA programming of fast phase evaluation -> fast profile analysis -> profile monitor |
| Analysis of plasma heating | ECRH power deposition from ECRH switching derived with the ECE zoom system |
| Plasma (particle) transport | Calculate particle transport (with the improved Thomson profiles) |
| Plasma spectroscopy | Neutral density measurements from warm Hα – asymmetries and particle transport. |
| Plasma spectroscopy | Outer-core measurements with passive CVI spectroscopy. |
| Plasma wall interactions | Tungsten erosion and transport (ERO 2.0 + new divertor) |
| Gas exhaust | Resudual gas analysis |
| Plasma heating | Wave Physics, ICW exitation by microwave beams |
| Plasma Dynamics | MANTIS Setup, Operation & Design: Validating island transport model (stellarator TPM) |
| Plasma Dynamics | Impact of convective (drift) transport on island plasma & synthetic diagnostic for MANTIS |
| Plasma Dynamics | Divertor physics in size & power flux scaling towards reactor values |
| Plasma Dynamics | Development of simplified stellarator divertor models towards optimization & systems codes |
| ITER Technology & Diagnostics | Vacuum-Ultraviolet (VUV) spectroscopy at low-temperature plasmas |
| ITER Technology & Diagnostics | Investigation of methane pyrolysis and dry reforming of methane in microwave plasma reactors |

| Postdoc | |
|---|---|
| **Focus** | **Topic** |
| Fast ion physics | FI loss diagnostics: wall integrated Faraday cup (QHF),  scintillator based FI diagnostic (QHS), Faraday cup midplane manipulator probehead (from NIFS) |
| Data evaluatuion in complex geometries | full 2D or 3D tomography of edge physics parameter using multiple diagnostics |
| Plasma heating | Technical and experimental optimization of NBI operation |
| Plasma heating | Technical and experimental optimization of ICRH operation |
| Neutral pressure gauges | R&D on reactor relevant neutral gas pressure gauges |
| Heat exhaust | Data evaluation from OP2, diagnostic operator, calibrations |
| Particle exhaust | Modeling of neutral gas pressure (ANSYS, DIVGAS) + code development |
| Plasma edge physics | EMC3-EIRENE (-Lite) modeling of plasma edge, experimental support |
| Heat exhaust and power balance | Data evaluation from divertor calorimetry and thermo couples |

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| Magentic field topology | Topology, mapping and error field simulation vs. flux surface mapping/IR images |
| Turbulence | HIBP setup and operation (alternatively MPM) |
| MHD | Equilibrium reconstruction using the SPEC code |
| MHD | X-ray multi-channel camera development |
| MHD | Development of online equilibrium reconstructions |
| ITRP | Synthetic island model for integrated analysis |
| ITRP | W7-X closed divertor modeling |
| ITRP | Impurity transport, impurity fluctuation diagnostics & transport analysis framework/CXRS/LBo |
| Engineering analysis | Thermomechanical analysis |
| ITER Technology & Diagnostics | Application of the 3D-MC-PIC Code ONIX to Sources for Negative Hydrogen Ions |
| ITER Technology & Diagnostics | Experimental Physics for Neutral Beam Injection on the ASDEX Upgrade Tokamak |
| ITER Technology & Diagnostics | Optical Emission Spectroscopy at a Source for Negative Hydrogen Ions |
| ITER Technology & Diagnostics | Conceptual Engineering of Neutral Beam Injection for the EUROfusion Volumetric Neutron Source |
| ITER Technology & Diagnostics | experimental physics for the development of the ITER bolometer diagnostic |
| ITER Technology & Diagnostics | Development of modular microwave plasma reactor for $CO_2$ conversion with oxygen separation |

| specific topics (PhD or Postdoc) | |
|---|---|
| **Focus** | **Topic** |
| Development of plasma diagnostics | Spectral in situ ellipsometer for PSI studies |
| | Fast Thomson as local diagnostic |
| | Neutral density measurements from warm H$\alpha$ – asymmetries and particle transport |
| | Continue impurity concentration studies from passive line ratios (N, Ne, Ar, He), including 2D emission tomography of imurity lines . Toroidal assymetries of seeded impurity transport. |
| | Outer-core measurements with passive CVI spectroscopy |
| | Stark broadening for ne measurement in the emission zone (using QSS70 signals, in Minerva) |
| | XICS Ti profile and ArXVIII density profile measurements |
| | profile reflectometry |
| ITER Technology & Diagnostics | development of Neutral Beam Injection (NBI) systems |
| | development of Neutral Beam Injection (NBI) systems |