

# Projekte der SNI-Doktorandenschule 2025

| Projekt   | Principle Investigator (PI) und Co-PI                                 | Doktorand:in |
|---|---|--------------|
| P1802 From Schrödinger's equation to biology: Unsupervised quantum machine learning for directed evolution of anti-adhesive peptides                                  | M. Nash (Univ. Basel)<br>A. von Lilienfeld (Univ. Wien/Univ. Toronto) | V. Doffini   |
| P1806 Image the twist!  | V. Scagnoli (PSI)<br>P. Maletinsky (Univ. Basel)                      | S. K. Treves |
| P1901 Microfluidics to study Huntington's Disease by visual proteomics  | T. Braun (Univ. Basel)<br>H. Stahlberg (EPFL)                         | A. Fränkl    |
| P1903 Neutron nanomediators for non-invasive temperature mapping of fuel cells  | M. Kenzelmann (Univ. Basel/PSI)<br>P. Boillat (PSI)                   | A. Ruffo     |
| P1905 Magnetic force microscopy with nanowire transducers   | M. Poggio (Univ. Basel)<br>E. Meyer (Univ. Basel)                     | L. Schneider |
| P2001 Imaging cardiovascular macro- and micro-structure using HfO <sub>2</sub> nanocrystals as X-ray tomography   | J. De Roo (Univ. Basel)<br>A. Bonnin (PSI)                            | E. Maksimova |
| P2002 A death-dealing bacterial nanomachine   | R. Lim (Univ. Basel)<br>M. Basler (Univ. Basel)                       | M. Brüderlin |
| P2004 Local manipulation of spin domains in a multi-ferroic Rashba semiconductor  | M. Muntwiler (PSI)<br>T. Jung (Univ. Basel/PSI)                       | M. Heinrich  |
| P2005 Transmembrane protein-mediated loading of synthetic compartments  | C. Palivan (Univ. Basel)<br>R. A. Kammerer (PSI)                      | P. Jaško     |
| P2006 RESTRAIN – Reticular chemistry at interfaces as a form of nanotechnology  | P. Shahgaldian (FHNW Muttentz)<br>J. De Roo (Univ. Basel)             | A. Roshan    |
| P2007 Development of nanoscale acoustic tweezers for mechanobiology application   | S. Tsujino (PSI)<br>R. Lim (Univ. Basel)                              | S. Jia       |
| P2008 Scanning nanowire quantum dot   | D. Zumbühl (Univ. Basel)<br>M. Poggio (Univ. Basel)                   | L. Forrer    |
| P2101 A planar nanofabrication process for coupled Schrödinger-cat qubits in parametrically-driven non-linear superconducting resonators                              | A. Grimm (PSI)<br>C. Bruder (Univ. Basel)                             | A. Bruno     |
| P2102 Structure and assembly mechanism of the Nijun-1 membrane perforation pore in executing cell death   | S. Hiller (Univ. Basel)<br>D. Müller (ETHZ D-BSSE)                    | M. Degen     |
| P2103 Goldnanoparticle assemblies for SERS based detection of EGFR expressing ovarian cancer cells in tumor xenografts  | S. Saxer (FHNW Muttentz)<br>V. Heinzelmann (Univ. Basel)              | A. Stumpo    |
| P2104 Methods to understand the role of ordered waters and disordered residues in enzyme catalysis using macromolecular crystallography at physiological temperatures | F. P. Seebeck (Univ. Basel)<br>J. H. Beale (PSI)                      | S. Bolotova  |

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| P2105 Ferromagnetism of mobile electrons in a two-dimensional semiconductor  | R. Warburton (Univ. Basel)<br>M. Poggio (Univ. Basel)       | R. Kaiser              |
| P2106 Innovative catalytic strategies to combat cancer   | T. R. Ward (Univ. Basel)<br>M. Fani (Univ. Basel)           | D. A. Graf             |
| P2107 High-sensitive torque magnetometry for 2D materials  | I. Zardo (Univ. Basel)<br>M. Poggio (Univ. Basel)           | M. Claus               |
| P2201 Strongly correlated electronic phases in twisted and stretched bilayer semiconductor nanostructures  | A. Baumgartner (Univ. Basel)<br>P. Maletinsky (Univ. Basel) | J. N Sunil             |
| P2202 Search for 2D ferromagnetism at room temperature   | M. Ciomaga Hatnean (PSI)<br>M. Kenzelmann (Uni Basel/PSI)   | E. D. Bervas-Soloviev  |
| P2203 Towards earth-abundant nanocatalysts for hydrogenation reactions: Understanding the promoting role of sulfur in cobalt phosphide nanocatalysts | M. F. Delley (Univ. Basel)<br>M. Nachtegaal (PSI)           | C. Yuan                |
| P2204 NanoPhase: A multi-scale view of phase separation from cells to nanostructure  | B. Engel (Univ. Basel)<br>M. Hondele (Univ. Basel)          | P. Van der Stappen     |
| P2205 MAGNET. MacEtch based nAnofabrication of hiGh aspect ratio silicon Nanowires with magnEtic Tips  | M. Stampanoni (PSI)<br>M. Poggio (Univ. Basel)              | B. Benz                |
| P2206 Multi-compartment nanofactories for on-site and on-demand drug synthesis and delivery  | O. Tagit (FHNWMuttENZ)<br>C. Palivan (Univ. Basel)          | A. Nikoletić           |
| P2207 Targeted scintillator nanoparticles for X-ray-mediated optogenetics in behaving mice   | A. A. Wanner (PSI)<br>J. De Roo (Univ. Basel)               | E. Liari               |
| P2301 NANO-PHOTO: NANOstructured protein materials for PHOTOCatalysis  | A. Bunzel (MPI, Marburg)<br>T. R. Ward (Univ. Basel)        | P. Elbers              |
| P2302 Elucidating synergistic effects of nano topography and peptide immobilisation on osteogenesis  | A. G. Guex (UZB)<br>M. Nash (Univ. Basel)                   | I. Imhof               |
| P2303 Vertical quantum dots in coupled Ge quantum wells  | A. Hofman (Univ. Basel)<br>I. Zardo (Univ. Basel)           | D. Nieri Orfatti       |
| P2304 Selective new-to-nature nanopores enabled by biomolecular condensation   | R. Lim (Univ. Basel)<br>M. Hondele (Univ. Basel)            | L. Beckert             |
| P2306 Enabling the challenging separation of radionuclides via the entrapment inside molecular containers  | K. Tiefenbacher (Univ. Basel)<br>P. J. Steinegger (PSI)     | A. Kharchenko          |
| P2307 Coherent feedback control of nanomechanical oscillators  | P. Treutlein (Univ. Basel)<br>P. Potts (Univ. Basel)        | A. Huot de Saint-Albin |
| P2308 A diamond-based spin-photon interface  | R. Warburton (Univ. Basel)<br>P. Maletinsky (Univ. Basel)   | M. Obramenko           |

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| P 2309 Understanding defects, substrate effects, and ribbon-ribbon interactions in 1D graphene nanoribbons via Raman spectroscopy | M. Calame (Empa)                                       | Á.V. Labordet Alvarez (associate) |
| P2401 Induced quantum dot microscopy of germanium and graphene quantum devices  | A. Hofmann (Univ. Basel)<br>M. Poggio (Univ. Basel)    | P. Raif                           |
| P2402 Spin waves get a twist!   | V. Scagnoli (PSI)<br>P. Maletinsky (Univ. Basel)       | E. Ersoy                          |
| P2403 Live recording of functional stimuli in single protein molecules using NV-ODMR  | S. Schmid (Univ. Basel)<br>P. Maletinsky (Univ. Basel) | R. Liu                            |
| P2404 Recruiting synthetic metal oxo nanoclusters as enzyme cofactors   | F. Seebeck (Univ. Basel)<br>J. De Roo (Univ. Basel)    | I. Nonikashvili                   |
| P2405 Novel mRNA nanotherapeutics against antibiotic-resistant pulmonary infections   | O. Tagit (FHNW)<br>D. Bumann (Univ. Basel)             | T. Flatmann                       |
| P2406 Artificial photosynthesis at sub-zero temperatures within cryo-protective lipidic mesophase nanoconfinement                 | Y. Yao (Univ. Basel)<br>F. Juranyi (PSI)               | K. Wang                           |
| P 2407 Raman spectroscopy for biomarker detection in wounds   | M. Calame (Empa)                                       | G. Guo (associate)                |