

# SNI PhD School projects 2025

Project	Principle Investigator (PI) and Co-PI	PhD student
P1802 From Schrödinger's equation to biology: Unsupervised quantum machine learning for directed evolution of anti-adhesive peptides	M. Nash (Univ. Basel) A. von Lilienfeld (Univ. Wien/Univ. Toronto)	V. Doffini
P1806 Image the twist!	V. Scagnoli (PSI) P. Maletinsky (Univ. Basel)	S. K. Treves
P1901 Microfluidics to study Huntington's Disease by visual proteomics	T. Braun (Univ. Basel) H. Stahlberg (EPFL)	A. Fränkl
P1903 Neutron nanomediators for non-invasive temperature mapping of fuel cells	M. Kenzelmann (Univ. Basel/PSI) P. Boillat (PSI)	A. Ruffo
P1905 Magnetic force microscopy with nanowire transducers	M. Poggio (Univ. Basel) 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) A. Bonnin (PSI)	E. Maksimova
P2002 A death-dealing bacterial nanomachine	R. Lim (Univ. Basel) M. Basler (Univ. Basel)	M. Brüderlin
P2004 Local manipulation of spin domains in a multi-ferroic Rashba semiconductor	M. Muntwiler (PSI) T. Jung (Univ. Basel/PSI)	M. Heinrich
P2005 Transmembrane protein-mediated loading of synthetic compartments	C. Palivan (Univ. Basel) R. A. Kammerer (PSI)	P. Jaško
P2006 RESTRAIN – Reticular chemistry at interfaces as a form of nanotechnology	P. Shahgaldian (FHNW Muttentz) J. De Roo (Univ. Basel)	A. Roshan
P2007 Development of nanoscale acoustic tweezers for mechanobiology application	S. Tsujino (PSI) R. Lim (Univ. Basel)	S. Jia
P2008 Scanning nanowire quantum dot	D. Zumbühl (Univ. Basel) 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) C. Bruder (Univ. Basel)	A. Bruno
P2102 Structure and assembly mechanism of the Ninnurin-1 membrane perforation pore in executing cell death	S. Hiller (Univ. Basel) 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) 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) J. H. Beale (PSI)	S. Bolotova

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

<b>Project</b>	<b>Principle Investigator (PI) and Co-PI</b>	<b>PhD student</b>
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) M. Poggio (Univ. Basel)	P. Raif
P2402 Spin waves get a twist!	V. Scagnoli (PSI) P. Maletinsky (Univ. Basel)	E. Ersoy
P2403 Live recording of functional stimuli in single protein molecules using NV-ODMR	S. Schmid (Univ. Basel) P. Maletinsky (Univ. Basel)	R. Liu
P2404 Recruiting synthetic metal oxo nanoclusters as enzyme cofactors	F. Seebeck (Univ. Basel) J. De Roo (Univ. Basel)	I. Nonikashvili
P2405 Novel mRNA nanotherapeutics against antibiotic-resistant pulmonary infections	O. Tagit (FHNW) D. Bumann (Univ. Basel)	T. Flatmann
P2406 Artificial photosynthesis at sub-zero temperatures within cryo-protective lipidic mesophase nanoconfinement	Y. Yao (Univ. Basel) F. Juranyi (PSI)	K. Wang
P 2407 Raman spectroscopy for biomarker detection in wounds	M. Calame (Empa)	G. Guo (associate)