

# PhD School projects 2023

Project	Principle Investigator (PI) and Co-PI	PhD student
P1603 A mechano-optical microscope for studying force transduction in living cells	R. Lim (Univ. Basel) E. Meyer (Univ. Basel)	T. Kozai
P1704 Evolving protease enzymes with new sequence specificity using peptide-hydrogel cell encapsulation	M. Nash (Univ. Basel) S. Reddy (D-BSSE, ETHZ Basel)	J. López Morales
P1705 Genetic selection of nanocatalysts	S. Panke (D-BSSE, ETHZ Basel) T. Ward (Univ. Basel)	E. Rousounelou
P1706 Ultrasensitive force microscopy and cavity optomechanics using nanowire cantilevers	M. Poggio (Univ. Basel) F. Braakman (Univ. Basel)	D. Jaeger
P1801 Bioinspired nanoscale drug delivery systems for efficient targeting and safe <i>in vivo</i> application	J. Huwyler (Univ. Basel) C. Palivan (Univ. Basel)	C. Alter
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. Basel)	V. Doffini
P1805 High-throughput multiplexed microfluidics for antimicrobial drug discovery	E. van Nimwegen (Univ. Basel) V. Guzenko (PSI)	M.-E. Alaball Pujol
P1806 Image the twist!	V. Scagnoli (PSI) P. Maletinsky (Univ. Basel)	S.K. Treves
P1808 Quantum dynamics of an ultracold ion coupled to a nanomechanical oscillator	S. Willitsch (Univ. Basel) M. Poggio (Univ. Basel)	M. Weegen
P1901 Microfluidics to study Huntington's Disease by visual proteomics	T. Braun (Univ. Basel) H. Stahlberg (Univ. Basel)	A. Fränkl
P1902 Directional 3D nanofiber network to mimic <i>in vivo</i> myocardial syncytium towards guiding contraction patterns in <i>in-vitro</i> heart models	M. Gullo (FHMW Muttentz) M. Poggio (Univ. Basel)	F. Züger
P1903 Neutron nanomediators for non-invasive temperature mapping of fuel cells	M. Kenzelmann (Univ. Basel/PSI) P. Boillat (PSI)	A. Ruffo
P1904 Revealing protein binding dynamics using time-resolved diffraction experiments at SwissFEL	C. Padeste (PSI) T.R. Ward (Univ. Basel)	M. Carrillo
P1905 Magnetic force microscopy with nanowire transducers	M. Poggio (Univ. Basel) E. Meyer (Univ. Basel)	L. Schneider
P1906 Machine learning assisted design of heteromeric self-assembled molecular capsules	K. Tiefenbacher (Univ. Basel) A. von Lilienfeld (Univ. Basel)	I. Martyn
P1907 Spin-opto-nanomechanics	P. Treutlein (Univ. Basel) P. Maletinsky (Univ. Basel)	G.-L. Schmid
P1908 Chiral recognition in molecular nanowires from square-planar Platinum(II) complexes	O. Wenger (Univ. Basel) C. Sparr (Univ. Basel)	A. Huber

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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
P2003 Nanoscale quantum sensing of complex spin systems in extreme environments	P. Maletinsky (Univ. Basel) M. Poggio (Univ. Basel)	J.A. Zuber
P2004 Local manipulation of spin domains in a multi-ferroic Rashba semiconductor	M. Muntwiler (PSI) T. Jung (Univ. Basel)	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) 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
P2009 Hybrid van der Waals heterostructures for vertical, permeable-base organic transistors	M. Calame (Univ. Basel) H.-J. Hug (Empa)	J. Oswald (associate)
P2101 A planar nanofabrication process for coupled Schrödinger-cat qubits in parametrically-driven nonlinear superconducting resonators	A. Grimm (PSI) C. Bruder (Univ. Basel)	A. Bruno
P2102 Structure and assembly mechanism of the Ninjurin-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 Muttenz) 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. Seebeck (Univ. Basel) J. H. Beale (PSI)	S. Bolotova
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

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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 (PSI / Uni Basel)	T. Geise
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 Stap- pen
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