

Selective transport through nanopores: physics meets biology

March 22nd – 27th 2015

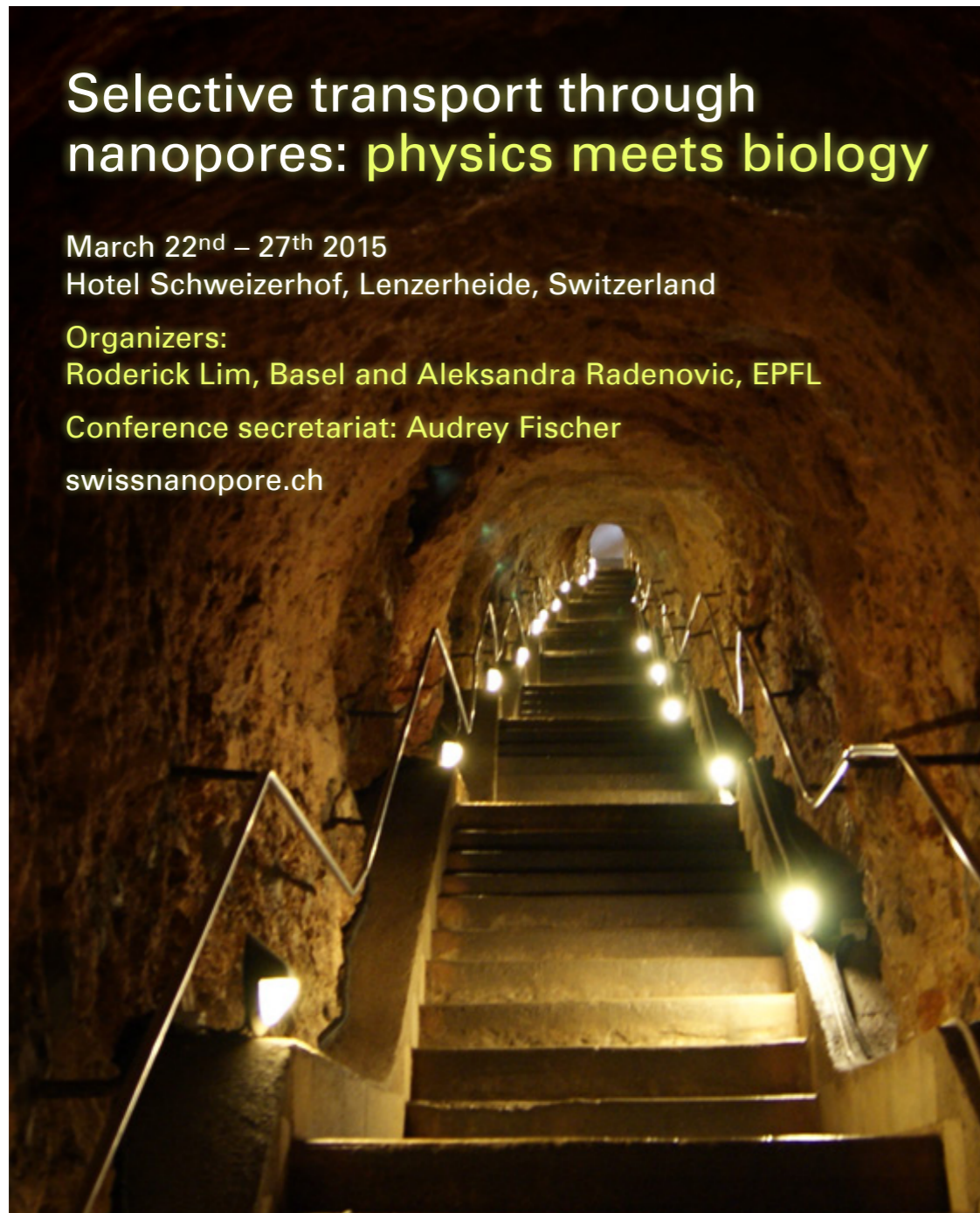
Hotel Schweizerhof, Lenzerheide, Switzerland

Organizers:

Roderick Lim, Basel and Aleksandra Radenovic, EPFL

Conference secretariat: Audrey Fischer

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Conference Program

Day 1, Sunday 22nd March

14.00 onwards	Arrival at hotel and registration
18.30 – 20.00	Dinner
20.00 – 20.40	Introduction / welcome address Rod Lim / Aleksandra Radenovic
20.40 – 22.00	Social

Day 2, Monday 23rd March

Topic: Beyond nanopores I

	Chair: Hagan Bayley (all talks: 30 min + 10 min Q&A)
08.30 – 09.10	Cees Dekker The versatility of solid-state nanopores: from DNA knotting to plasmonics to biomimetic nuclear pore complexes
09.10 – 09.50	John Kasianowicz Nanopore-based measurements single molecule biophysics – unlocking the fundamental properties of biological molecules for future applications
09.50 – 10.30	Michael Mayer Rotational dynamics of single proteins inside nanopores
10.30 – 11.00	Coffee break I
	Chair: Meni Wanunu (all talks: 30 min + 10 min Q&A)
11.00 – 11.40	Hagan Bayley Protein pores as nanoreactors for single-molecule covalent chemistry
11.40 – 12.20	Ulrich Keyser DNA origami nanopores: developments and challenges
12.20 – 14.00	Lunch

Topic: Molecular transport control I

	Chair: Stefan Howorka (all talks: 30 min + 10 min Q&A)
14.00 – 14.40	Mathias Winterhalter Quantification of antibiotic uptake across bacterial cell walls
14.40 – 15.20	Meni Wanunu Voltage-driven nucleosome and protein transport across synthetic nanopores
15.20 – 16.00	Coffee break II
	Chair: Cees Dekker (all talks: 30 min + 10 min Q&A)
16.00 – 16.40	Klaus Schulten Graphene nanopores for DNA sensing – a computational study
16.40 – 17.20	Vincent Tabard-Cossa Interfacing solid-state nanopores with gel media to slow DNA passage speeds
17.20 – 18.00	Stefan Howorka Membrane-spanning DNA nanopores
18.00 – 19.30	Dinner
19.30 – 21.00	Poster session I (Fabrication & functionalization / Sensing & detection)

Day 3, Tuesday 24th March

Topic: Barrier function I

	Chair: Tijana Jovanovic-Talisan (all talks: 30 min + 10 min Q&A)
08.30 – 09.10	Karsten Weis Modulation of nuclear pore permeability by Nup153
09.10 – 09.50	Sanford Simon Characterizing the dynamics and structure of FG-Nups <i>in vivo</i> with fluorescent microscopy
09.50 – 10.30	Joan Pulupa Exploring FG-Nup behavior in a coarse-grained computational model of the nuclear pore complex
10.30 – 11.00	Coffee break I
	Chair: Mohammad Mofrad (all talks: 30 min + 10 min Q&A)
11.00 – 11.40	Bart Hoogenboom Computational and nanomechanical approaches to probe polymer arrangements in the nuclear pore complex
11.40 – 12.20	Ajay Gopinathan Polymer brush gating: From sequence design to transport regulation
12.20 – 14.00	Lunch

Topic: Molecular transport control II

	Chair: Bart Hoogenboom (all talks: 30 min + 10 min Q&A)
14.00 – 14.40	Igal Szleifer Responsive synthetic (and biological) nanopores
14.40 – 15.20	Rob Coalson Polymer brush nanovalves controlled by attractive nanoparticle infusion: Design principles
15.20 – 16.00	Coffee break II
	Chair: Ralf Richter (all talks: 30 min + 10 min Q&A)
16.00 – 16.40	Tijana Jovanovic-Talisan Nano-scale investigation of the tumor marker protein Nup88
16.40 – 17.20	Patrick Onck Coarse grained molecular modeling of the disordered domain of nuclear pores
17.20 – 18.00	Anton Zilman Simple physical considerations explain the conformational transitions of FG nucleoporins induced by the nuclear transport factors
18.00 – 19.30	Dinner
19.30 – 21.00	Poster session II (Molecular transport control / Barrier function)

Day 4, Wednesday 25th March

08.30 – 12.20	Freetime
12.20 – 14.00	Lunch
14.00 – 15.20	Group discussion
15.20 – 16.00	Coffee break I

Topic: Fabrication and functionalization

	Chair: Ulrich Keyser (all talks: 30 min + 10 min Q&A)
16.00 – 16.40	Mubarak Ali Ionic conduction and biosensing capabilities of functionalized track-etched single conical nanopores
16.40 – 17.20	Annette Andrieu-Brunsen Towards control on polymer-modification of mesoporous silica thin films and its effect on ionic permselectivity gating
17.20 – 18.00	Jan Linnros Formation of silicon nanopore arrays by electro-chemical etching
18.00 – onwards	Conference dinner

Day 5, Thursday 26th March

Topic: Sensing and detection

	Chair: Fabien Montel (all talks: 30 min + 10 min Q&A)
08.30 – 09.10	Jan Behrends Mass sensitive detection of polymers with biological nanopores: beyond PEG and alpha-Hemolysin
09.10 – 09.50	Amit Meller Single-molecule optical sensing in solid-state nanopores
09.50 – 10.30	Aleksandr Noy Molecular transport through carbon nanotube porins in lipid membranes
10.30 – 11.00	Coffee break I
	Chair: Edward Lemke (all talks: 30 min + 10 min Q&A)
11.00 – 11.40	Weidong Yang Three-dimensional imaging of single-molecule trafficking inside sub-micrometer cellular tubes/channels by SPEED microscopy
11.40 – 12.20	Laurent Bacri Sensing proteins, polyelectrolytes and polymers by nanopores
12.20 – 14.00	Lunch

Topic: Barrier function II

	Chair: Weidong Yang (all talks: 30 min + 10 min Q&A)
14.00 – 14.40	Liesbeth Veenhoff Size-dependent leak of soluble and membrane proteins through the yeast nuclear pore complex
14.40 – 15.20	Mohammad Mofrad Multiscale models of the nuclear pore complex
15.20 – 16.00	Coffee break II
	Chair: Anton Zilman (all talks: 30 min + 10 min Q&A)
16.00 – 16.40	Edward Lemke Single molecule and microfluidic tools to study dynamic protein complexes
16.40 – 17.20	Ralf Richter Ultrathin FG domain films to elucidate mechanisms of assembly and function of the nuclear pore permeability barrier
17.20 – 18.00	Sigfried Musser Single-molecule rotational mobility within nuclear pores determined by polarization-PALM
18.00 – 19.30	Dinner

Day 6, Friday 27th March

Topic: Beyond nanopores II

	Chair: Aleksandra Radenovic (all talks: 30 min + 10 min Q&A)
08.30 – 09.10	Giovanni Maglia Control of the entry and residence time of proteins and DNA inside a ClyA nanopore
09.10 – 09.50	Fabien Montel Zero-mode waveguide detection of biomolecular translocation through nanopores
09.50 – 10.30	Julio Rodriguez-Manzo Molecular sensing in thinned silicon membranes
10.30 – 11.00	Coffee break I
	Chair: Giovanni Maglia (all talks: 30 min + 10 min Q&A)
11.00 – 11.40	David Rodriguez-Larrea Protein unfolding, translocation and refolding through nanopore membrane pores
11.40 – 12.20	Kevin Freedman Functionalized nanopores for single molecule delivery, temperature control, and SERRS detection
12.20 – 13.00	Recap and future plans
13.00 – onwards	Lunch / departure