

Physics of viruses

Sarah Köster (Göttingen) and Ulrich Schwarz (Heidelberg)

Sunday Sept 10	
Arrival and Get Together	
16.00-18.00	Arrival
18.00-20.00	Dinner
20.00-21.00	Sarah Köster and Ulrich Schwarz: Welcome and introduction to summer school
Monday Sept 11	
Capsid structure and assembly	
08.00-09.00	Breakfast
09.00-10.30	Lecture #1: Ulrich Schwarz: Introduction to the physics of viruses
10.30-11.00	Coffee break
11.00-12.30	Lecture #2: Reidun Twarock: Capsid structure
12.30-14.00	Lunch break
14.00-15.30	Lecture #3: Michael Hagan: Theory and simulation of virus assembly
15.30-16.00	Coffee break
16.00-17.30	Lecture #4: Gonen Golani: Theory of membrane fusion during virus entry
18.00-19.00	Dinner
19.00-21.00	Poster session
Tuesday Sept 12	
Virus mechanics and entry	
08.00-09.00	Breakfast
09.00-10.30	Lecture #5: Rommie Amaro: Whole virus simulations and binding
10.30-11.00	Coffee break
11.00-12.30	Lecture #6: Wouter Roos: Capsid mechanics
12.30-14.00	Lunch break
14.00-15.30	Lecture #7: Ada Cavalcanti-Adam: Virus attachment and entry
15.30-16.00	Coffee break
16.00-18.00	Contributed talks: Jens Timmer: Substrate Stiffness and Particle Properties Influence Cellular Uptake of Nanoparticles and Viruses from the Ventral Side Salvatore Chiantia: Investigating virus-host interactions at a single cell level using quantitative fluorescence microscopy Horacio Guzman: Multiscale modeling of RNA genome inside viruses: Insights from secondary to tertiary structure models
18.00-19.00	Dinner
19.00-21.00	Tutorial #1: Brownian Dynamics of capsid assembly with HOOMD
Wednesday Sept 13	
Whole virus analysis	
08.00-09.00	Breakfast
09.00-10.30	Lecture #8: Sarah Köster: Experimental methods
10.30-11.00	Coffee break
11.00-12.30	Lecture #9: Petr Chlanda: Cryo electron tomography of whole viruses
12.30-14.00	Lunch break

14.00-15.30	Lecture #10: Beata Turonova: Integrative analysis of electron microscopy data
15.30-16.00	Coffee break
16.00-18.00	Tutorial #2: Petr Chlanda/Beata Turonova: Analysis of electron microscopy data
18.00-19.00	Dinner
19.00-	Excursion to downtown Bonn
Thursday Sept 14	
Virus replication and spread	
08.00-09.00	Breakfast
09.00-10.30	Lecture #11: Viola Priesemann: Modelling virus spread
10.30-11.00	Coffee break
11.00-12.30	Lecture #12: Igor Kulic: Virus transport
12.30-14.00	Lunch break
14.00-15.30	Lecture #13: Eberhard Bodenschatz: Virus transmission and masks
15.30-16.00	Coffee break
16.00-18.00	Excursions to „Haus der Geschichte der Bundesrepublik Deutschland“ and to „Adenauer Haus“
18.00-19.00	Dinner
19.00-21.00	Tutorial #3: Richard Neher: Sequence analysis and Nextstrain
Friday Sept 15	
Fighting viruses	
08.00-09.00	Breakfast
09.00-10.30	Lecture #14: Richard Neher: Virus evolution and forecasting
10.30-11.00	Coffee break
11.00-12.30	Lecture #15: Hendrik Dietz: Synthetic viruses and immune recognition
12.30-14.00	Lunch and departure