



Provisional Program
Winter School on Physics of the Cell (CellPhys@TN3)
12-23 January 2026

Coordinated by Gianluca Lattanzi (UniTrento) and Daniele Dell'Orco (UniVr)

WEEK 1 – Monday 12/01 - Welcome day
9.00 - 10.30 Registration and orientation session at the <u>School of Innovation (Sol)</u> , Via Tommaso Gar 16/2, CLAB M, 1st floor, and breaking of the ice, by the International Relations Division - joint activity with group of Winter school MISOCCHANGE
10.30 - 11.15 Welcome snack, networking
11.30 - 12.30 Split of the two groups - Introductory speech by the academic coordinators, at Sol, CLAB S, 1st floor
12.30 - 14.15 First lunch at the university restaurant in <u>Via Tommaso Gar 18</u> , together with the students' collaborator
14.15 - 16.15 Kick-off: CBL methodology, team formation, overview of the school (G. Lattanzi - D. Dell'Orco)
16.30 - 18.00 Guided tour of Trento - joint activity with group of Winter school MISOCCHANGE - meeting point at the Neptune fountain in Cathedral Square
Dinner and evening free
Tuesday 13/01 - Computational Biomolecules I (G. Lattanzi)
9.00 - 10.30 Lecture: All-atom modeling of biomolecules
10.30 - 12.00 Tutorials: short MD demo on a small protein/nucleic acid (visualization + trajectory analysis)
12.00 - 13.30 Lunch break
13.30 - 17.00 Challenge focus: test whether atomistic simulations can reproduce experimental observables (RMSD, binding, etc.)
Dinner and evening free
Wednesday 14/01 - Experimental Techniques in Cell Physics (M. Scarpa)
9.00 – 12.30: A healthy start on the snow: a 2-hour walk with snowshoes on Monte Bondone with the other group of MISOCCHANGE Winter school. Transfer by private bus. Please bring a complete change to leave on board. Meeting point at 8.30 at the <u>bus stop in Via Torre Vanga 26</u>
13.00 - 14.30 Lunch break
14.30 - 17.00 Lecture: microscopy (fluorescence, super-resolution), spectroscopy, micromanipulation.
Dinner and evening free
Thursday 15/01 - Computational Biomolecules II (L. Monticelli)
9.00 - 10.30 Lecture: Multiscale Approaches to Molecular Complexes (coarse graining, hybrid models)
10.30 - 12.00 Tutorial: coarse graining of a protein/DNA system.
12.30 - 14.00 Lunch break
14.00 - 17.00 Challenge focus: combine atomistic and coarse-grained models to simulate a large biomolecular complex
Dinner and evening free
Friday 16/01- Statistical Physics in Biology (G. Tiana)
9.00 - 10.30 Lecture: thermodynamics in the cell, entropy, energy transduction.
10:30 - 12:00 Tutorial: diffusion, Langevin dynamics.
12.00 - 13.30 Lunch break
13.30 - 15.30 Challenge focus: model nutrient uptake efficiency under diffusion limits.
16.00 – 17.30 Guided tour of MUSE and free time in the Museum - joint activity with group of Winter school MISOCCHANGE
Dinner and evening free



Enjoy your weekend with the International Relations Division hints for the week end!

WEEK 2 – Monday 19/01 - Biophysics for Medicine (F. Tommasino - F. Cordoni)
9.00 – 10.30 Lecture: Proton Therapy
10.30 - 12.00 Tutorial: dose distribution modeling
12.00 - 13.30 Lunch break
13.30 - 17.00 Challenge: propose a physical model to connect sensing or therapy outcomes to measurable parameters.
Tuesday 20/01 - Mechanobiology (M. Karttunen)
9.00 - 10.30 Lecture: <i>Cell Growth and Mechanobiology</i> (forces, shape, response).
10.30 - 12.00 Tutorial: CellSim3d
12.00 - 13.30 Lunch break
13.30 - 17.00 Challenge focus: simulate/mechanistically explain how cells adapt their shape under stress.
Dinner and evening free
Wednesday 21/01 - Relax and have fun!
9.30-18.00 All-day excursion to Garda Lake (Riva del Garda and Arco) - joint activity with group of Winter school MISOCCHANGE Meeting point at 9.15 at the <u>bus stop in Via Torre Vanga 26</u>
Dinner and evening free
Thursday 22/01- Physics of Vision (D. Dell'Orco)
9.00 - 10.30 Lecture: Physics of vision
10.30 - 12.00 Tutorial: data-to-model approaches
12.00 - 13.30 Lunch break
13.30 - 17.00 Challenge focus: to be defined
Dinner and evening free
Friday 23/01 - Conclusions and greetings
10.00 - 12.00 Be a travel agent for one day, delivery of attendance certificates, satisfaction survey. Sharing of your best shots, videos, and feelings, by the International Relations Division - joint activity with group of Winter school MISOCCHANGE, CLAB M
12.00 - 12.30 Concluding remarks by the academic coordinators
12.30 – 14.00 Farewell lunch at Restaurant Rosa D'Oro, Trento, last pictures and departure - joint activity with group of Winter school MISOCCHANGE

Disclaimers:

- This is a provisional program, titles and times of the lessons might slightly change
- Unless otherwise indicated in the program, classes will be held at School of Innovation, 1st floor: CLAB S
- Compulsory post-Winter School online session:
On 23 February either from 9.00 to 11.00 am (CEST), or from 3.00 to 5.00 pm (CEST).