



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 School of Innovation (Sol), 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 MISOCHANGE

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 M, 1st floor

12.30 - 14.15 First lunch at the university restaurant in Via Tommaso Gar 18, 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 MISOCHANGE - 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, CLAB S

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 MISOCHANGE Winter school. Transfer by private bus. Please bring a complete change to leave on board. Meeting point at 8.30 at the [bus stop in Via Torre Vanga 26](#)

13.00 - 14.30 Lunch break at the canteen in Povo (up-hill)

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 MISOCHANGE

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. Cordini)**

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: *Cell Growth and Mechanobiology* (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 Rovereto) - joint activity with group of Winter school MISOCHANGE Meeting point at 9.15 at the bus stop in Via Torre Vanga 26

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 MISOCHANGE, 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 MISOCHANGE

**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, 1<sup>st</sup> 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).