

Third week

Expectations: The student workload will include both formal and research project preparation effort. Students will begin consideration and literature study for their more-extended research project (requiring them to select their area of project work). They will prepare a short research plan. The final project report will be in the format of a scientific paper with relevant referencing.

- R-matrix method, computational and phenomenological aspects. Resolution of the Schrodinger equation with the computational R-matrix. Example: determining scattering cross sections from optical potentials. Analysis of experimental cross sections with the phenomenological R-matrix. Example: extracting energies and widths of resonances from actual data. Extensions to multichannel problems and to radiative capture. (Monday and Tuesday, week 3) – Lecturers Descouvemont, Simpson
- Microscopic descriptions of reactions based on cluster models: explicit antisymmetrization and the resonating group method (RGM). Equivalence between the RGM and the Generator Coordinate Method (GCM). Applications to simple systems: alpha+nucleon and alpha+alpha. Generalizations to multi-cluster system descriptions, and to ab-initio calculations. (Wednesday/part Thursday, week 3) – Lecturer Descouvemont
- Q&A session. Discussion of final project timescales, expectations and selection. (part Thursday pm, week 3)
- Review. Collective and/or individual discussions of final research project (Friday, week 3)