

ADVANCED TOPICS IN NUCLEAR DYNAMICS AND REACTION MECHANISMS WITH STABLE AND RADIOACTIVE BEAMS

2 CFU

Teaching staff

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Reception hours: Monday 15-17

Program of the course:

1-Production techniques of RIBS (radioactive ion beams)

- a) Isol and in-flight methods
- b) from the beam production to the tagging

2-HI nuclear reactions mechanism from low to intermediate energy

- a) physics case (complete and incomplete fusion, multifragmentation, equation of state, symmetry energy, isospin effects)
- b) experimental methods to select reaction mechanism c) experimental devices

Bibliography:

1 - Production techniques of RIBS (radioactive ion beams)

- Blumenfeld Y, Nilsson T and Van Duppen P, Facilities and methods for radioactive ion beam production, 2013 Phys. Scr, T152 014023
- Lombardo et al. Use of Large Surface MicroChannel Plates for the Tagging of Intermediate

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2- HI nuclear reactions mechanism from low to intermediate energy

- S. Pirrone, G. Politi, B. Gnoffo, ..., et al.: "isospin influence on fragments production in $78\text{Kr}+40\text{Ca}$ and $86\text{Kr}+48\text{Ca}$ collisions at 10 MeV/nucleon", EPJ A 55, 22, (2019)
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- • Russotto, P., Cozma, M.D., De Filippo, E. et al. Studies of the equation-of-state of nuclear matter by heavy-ion collisions at intermediate energy in the multi-messenger era. Riv. Nuovo Cim. 46, 1–70 (2023).
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- E. De Filippo, A. Pagano, P. Russotto et al., Correlations between emission timescale of fragments and isospin dynamics in $124\text{Sn}+64\text{Ni}$ and $112\text{Sn}+58\text{Ni}$ reactions at 35 A MeV. Phys. Rev. C 86, 014610 (2012).
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<https://doi.org/10.1103/PhysRevC.90.034609>