



M.Sc. in Physical Science
Biomedical Physics

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2 years English M.Sc.

Biomedical Physics → Application of physics to biological phenomena and complex systems in medical research and health protection

Multidisciplinary approach → biology
→ medicine
→ chemistry

Basic and applied research in



Medical Diagnostics

CT – MRI – PET – SPECT – MEDICAL SENSORS

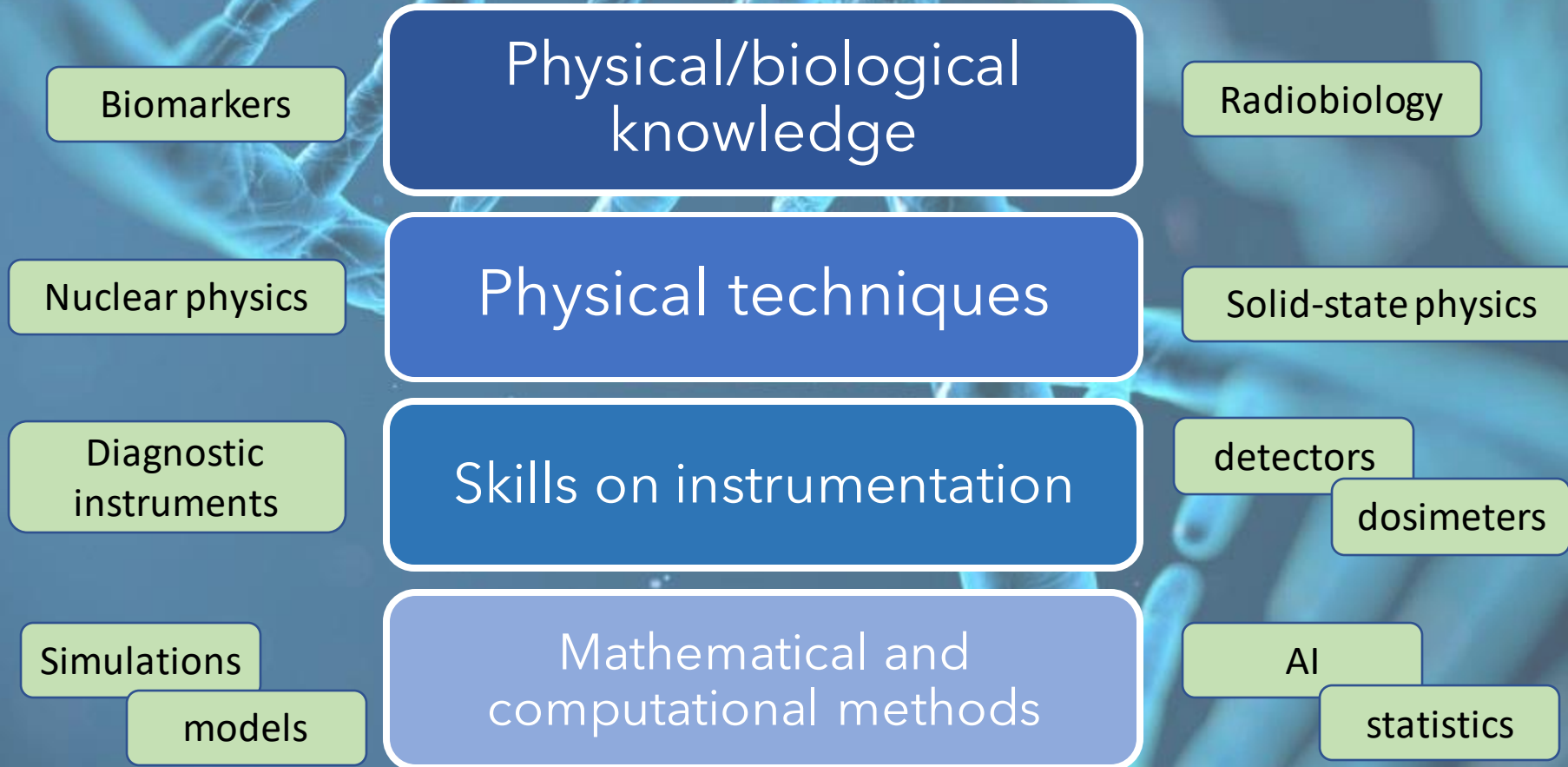
Clinical Therapy

External/Internal radiotherapy
hyperthermia

Radiation Protection

Dosimetry

Skills acquired



Fields of application

Biomedical Research

Hospitals

Pharma

Medical industry

IT Companies



Example: research in oncology



Imaging (different experimental methods)



Image analysis and treatment (AI)



Sensors for biomarkers



Innovative radiation treatments



Effects at cellular and subcellular level



Computational radiobiology and biophysics

Example: research in oncology



Imaging

alessandro.lascialfari@unipv.it



Image analysis (AI)

ian.postuma@unipv.it



Sensors

franco.marabelli@unipv.it



Treatment silva.bortolussi@unipv.it - nicoletta.protti@unipv.it - andrea.fontana@pv.infn.it



Cell Effects

giorgio.baiocco@unipv.it



Computational radiobiology

francesca.ballarini@unipv.it



Medical techniques in diagnostics and therapy are evolving very rapidly

Technological development is crucial

Physicists are prepared on experimental, theoretical and computational techniques

Disciplines such as statistics, complex analysis, artificial intelligence, simulations can improve knowledge in medical field

When radiation is used in medicine, physicists play pivotal role

42 CFU

Physics of Ionizing Radiation	FIS/04	I sem
Physics of Medical imaging	FIS/07	I sem
Medical diagnostic techniques with ionizing radiation	FIS/07	II sem
Introduction to ionizing radiation protection	FIS/07	II sem
Rehology and Diagnostic Techniques: theory and practice	FIS/07	I sem
Laboratory of ionizing Radiation	FIS/04	II sem
Computational Methods in Physics	FIS/02	II sem

54 CFU mandatory

General biology, anatomy and human physiology	BIO/06	I sem
Radiation biophysics and radiobiology	MED/36	II sem

12 CFU

6 CFU to be chosen among

Statistical Methods in Physics	FIS/01	I sem
Artificial Intelligence for Experimental and Applied Physics	FIS/01	I sem
Particle detectors	FIS/01	II sem
Physics of innovative oncological therapy techniques	FIS/07	I sem
Simulations in medical physics	FIS/07	I sem

+ free-choice 12 CFU

+ 6 CFU other activities

+ 42 CFU final thesis



Thesis & Internships & LM+



CNAO

LENA

Bracco Spa (pharma Company)

Stelar Srl (NMR Company)

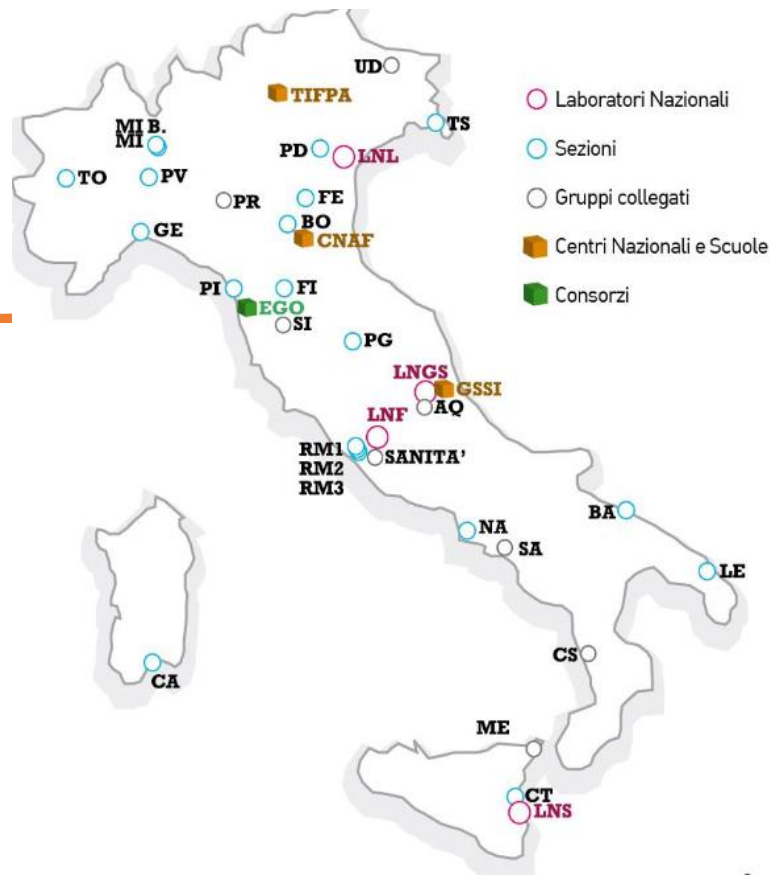
Bruker Srl (technological Company)

+ International networks of research groups

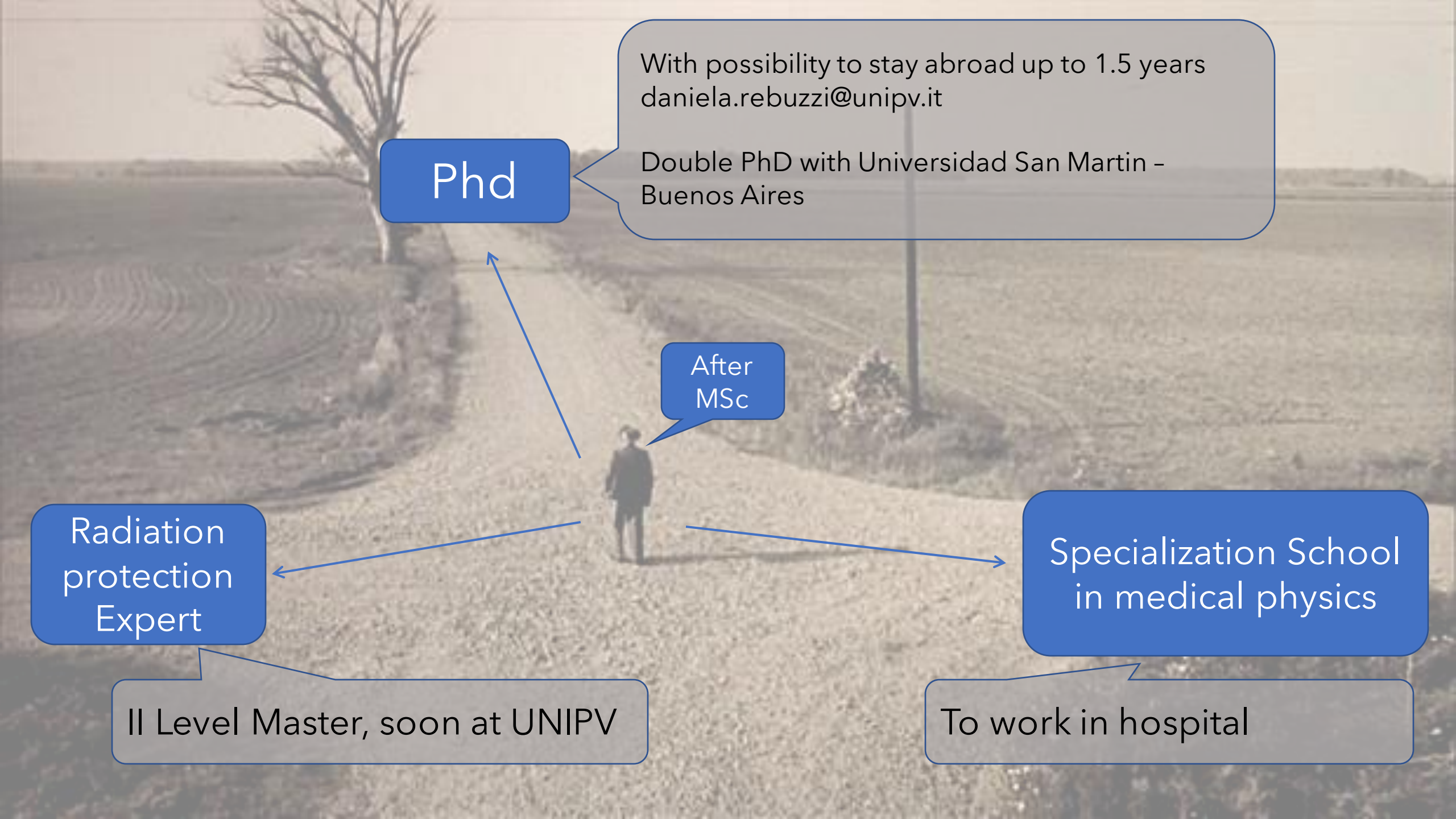


Istituto Nazionale di Fisica Nucleare

Work in funded projects
Be associated to INFN
Interdisciplinary aspects
National Network
Access to National & Labs



Ask the CSN5 coordinator to know about ongoing projects



Phd

With possibility to stay abroad up to 1.5 years
daniela.rebuzzi@unipv.it

Double PhD with Universidad San Martin -
Buenos Aires

After
MSc

Radiation
protection
Expert

Specialization School
in medical physics

II Level Master, soon at UNIPV

To work in hospital



More Info here:

Radiation Biophysics and
Radiobiology

NMR/MRI/Hyperthermia
Imaging

Biophysics and Biosensing



Boron Neutron Capture Therapy

Computational Radiobiology

Medical Radionuclides