

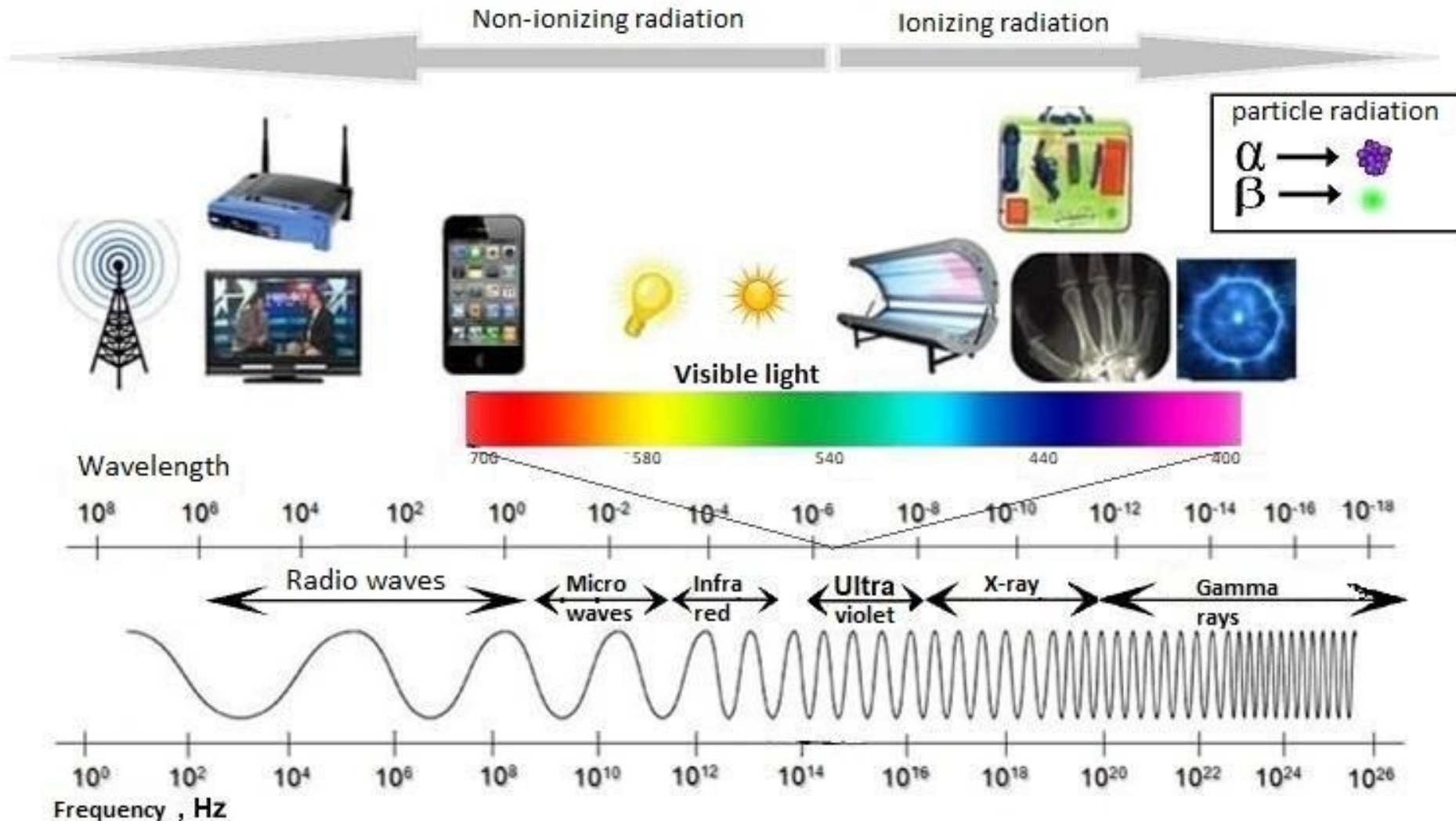
CERIC

PaGES⁷

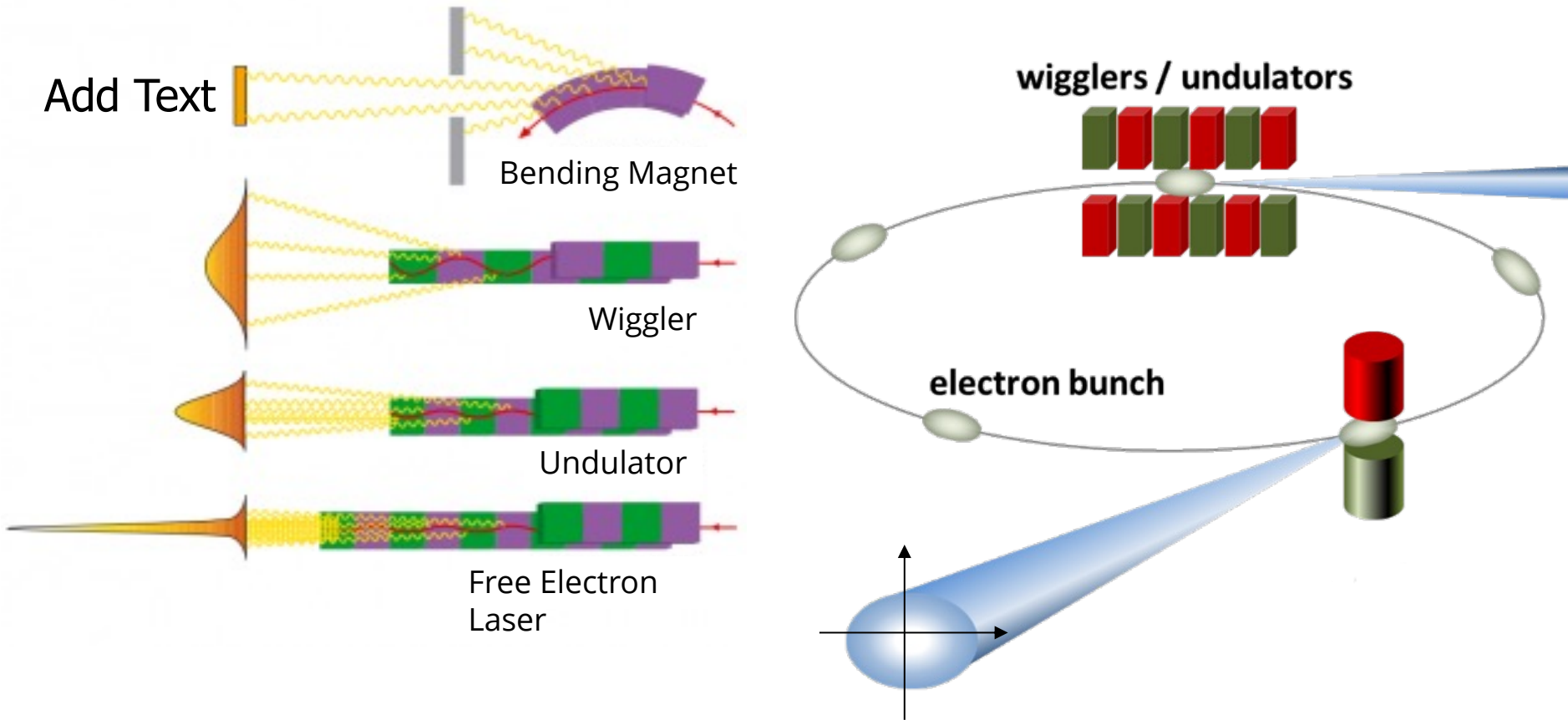
Planning,
Management and
Execution of a
Scientific Experiment in
an international research
infrastructure

La spettroscopia Raman nella scienza

The electromagnetic spectrum



What is Synchrotron Radiation



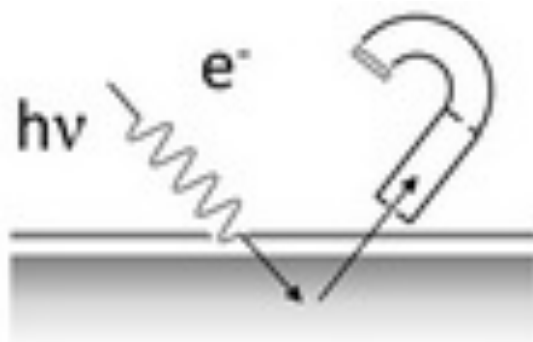
- **10^{10} brighter than the most powerful (compact) laboratory sources**
- **SR is a light source that irradiates all “colors”**

Elettra is the largest materials research center in Italy, specialized in generation Synchrotron (SR) and free-electron laser (FEL) light for Material and Life Sciences research

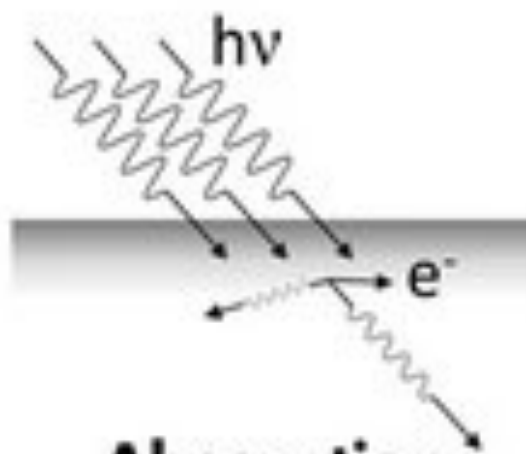


Elettra Synchrotron Radiation Facility

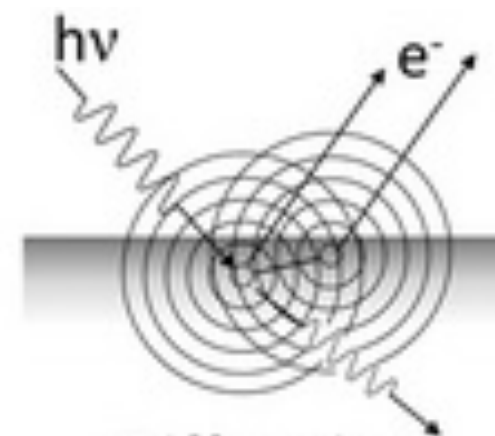
FERMI seeded Free Electron Laser Facility



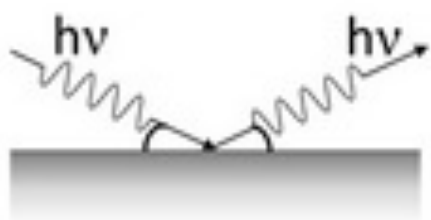
**Photoelectron
emission**



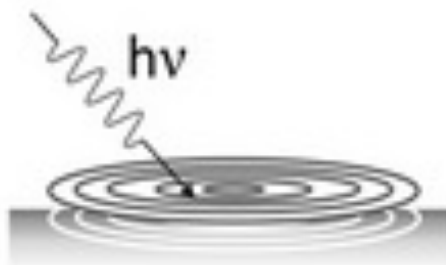
Absorption



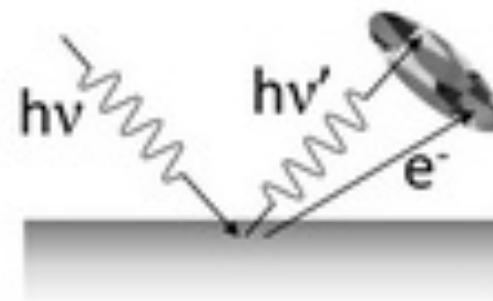
Diffraction



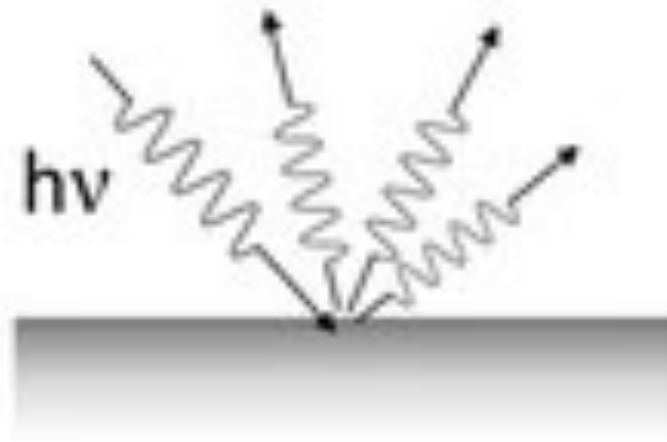
**Reflection/
Emission**



Lithography



Imaging

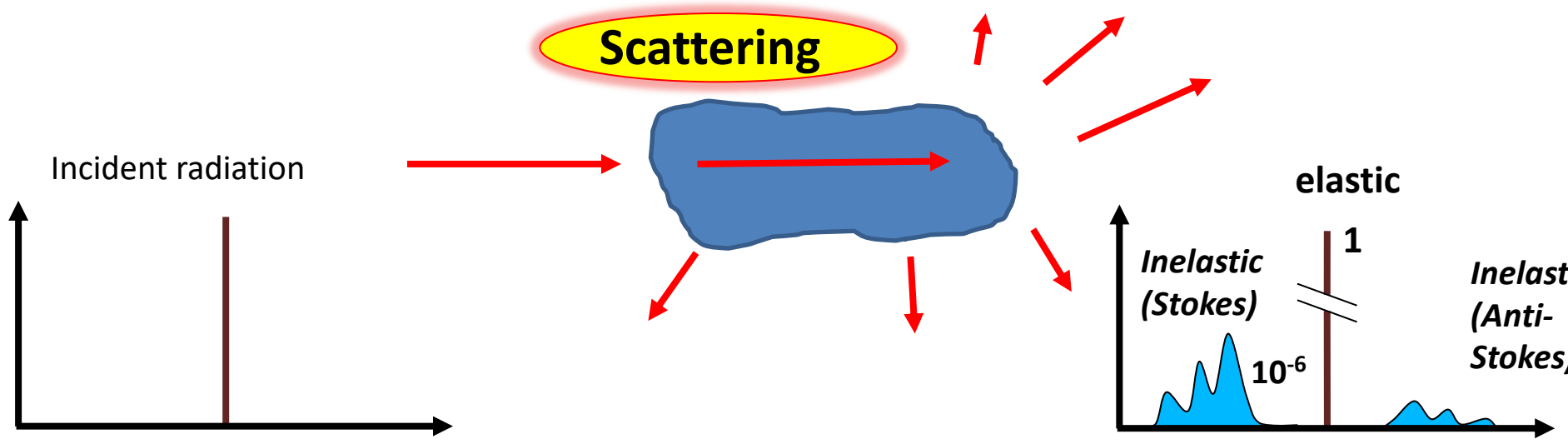
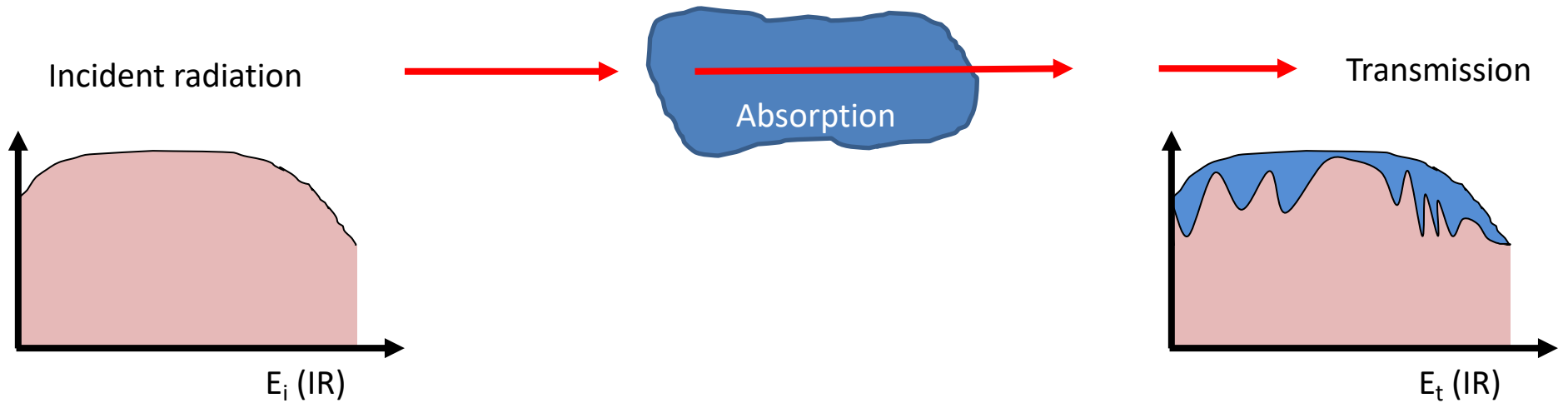


Scattering

Raman scattering

The Elettra beamlines

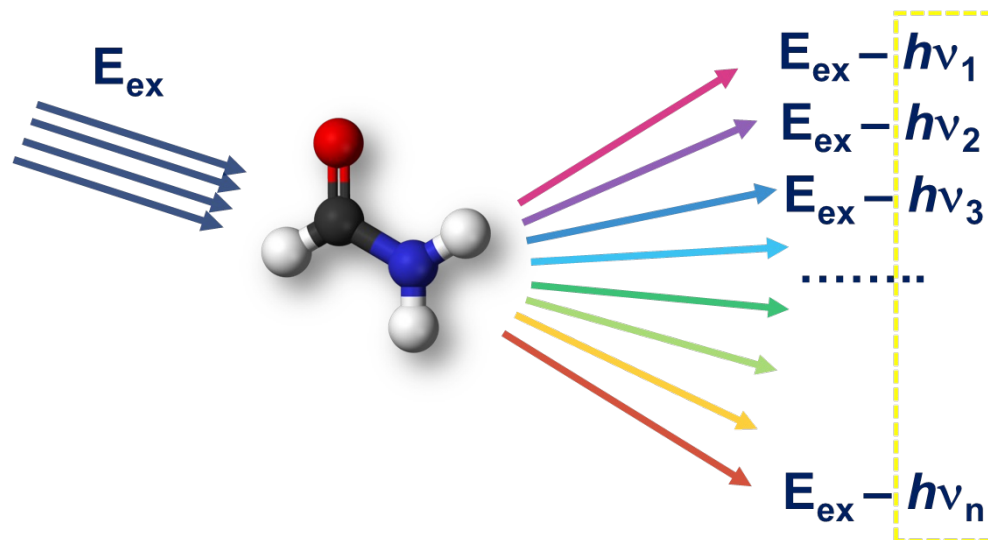




The Raman effect



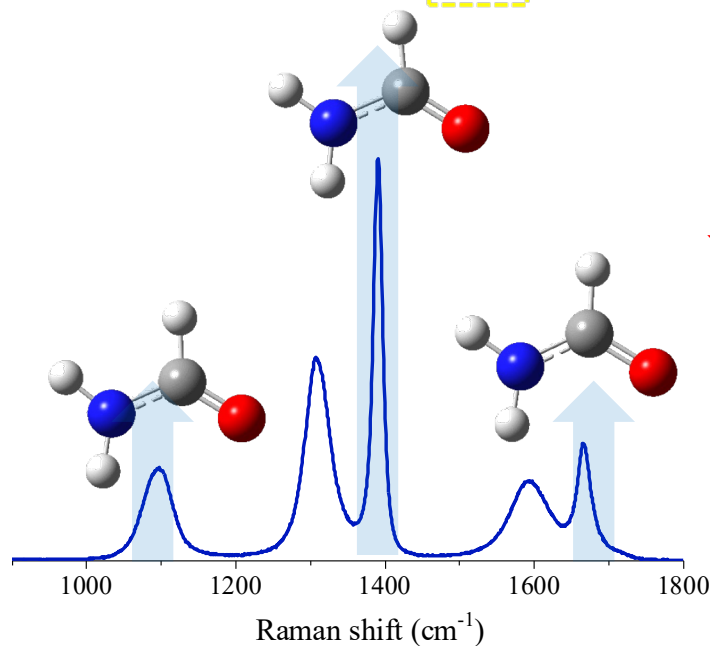
Sir C. V. Raman
Physics Nobel prize (1930)



shift in photon energy due to excitation of
molecular vibrations

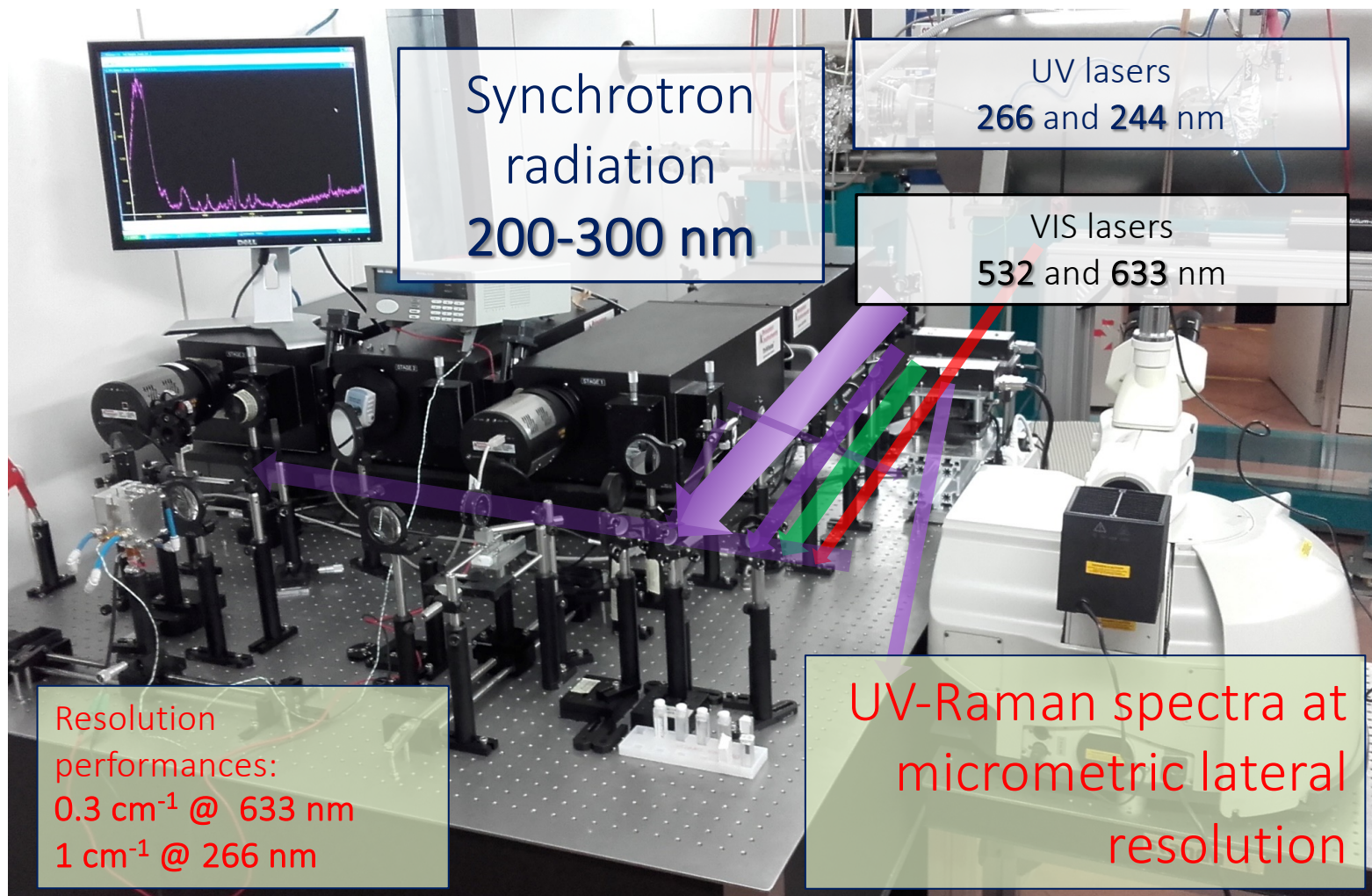


vibrational signature of the
molecular system



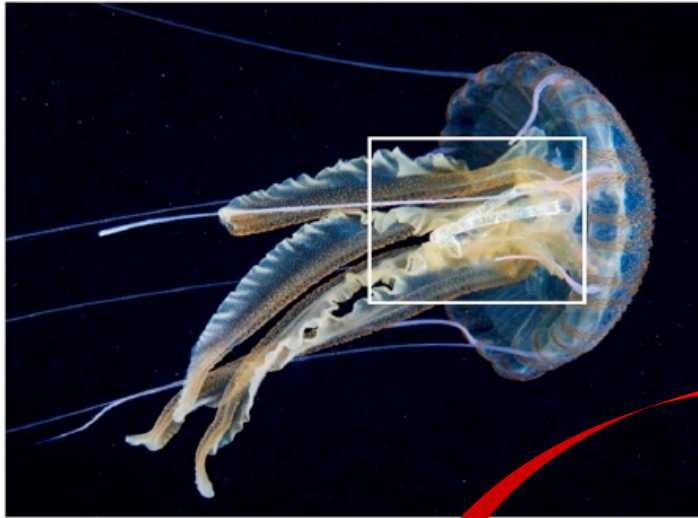
IUVS Raman setup

F. D'Amico et al. *NIMA* 2013.



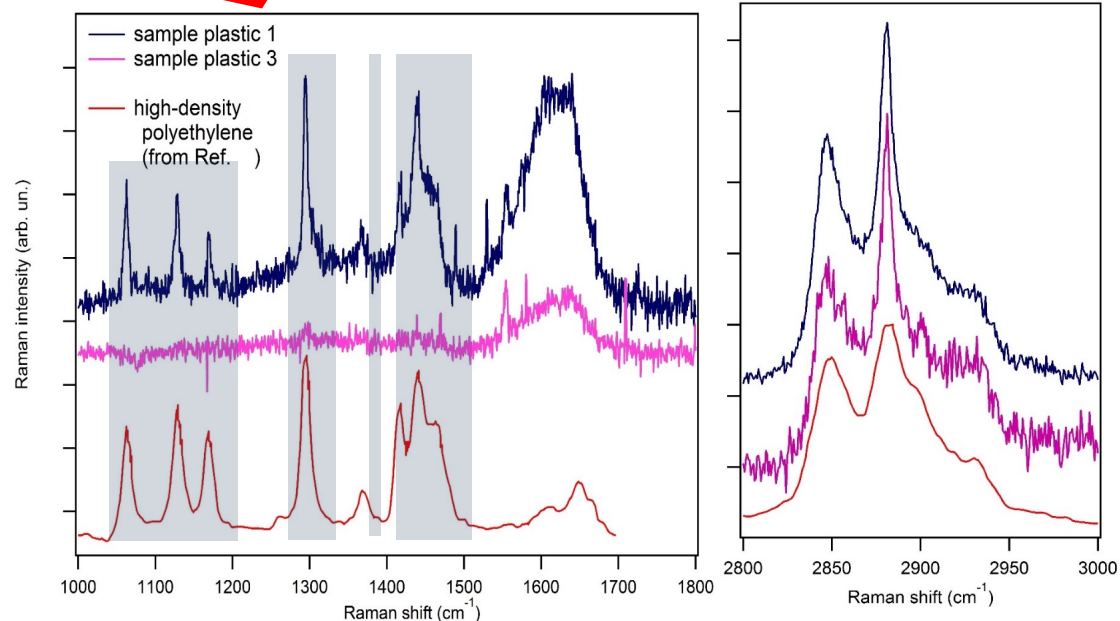
Esempio 1

Recognition of plastic fragments in jellyfish

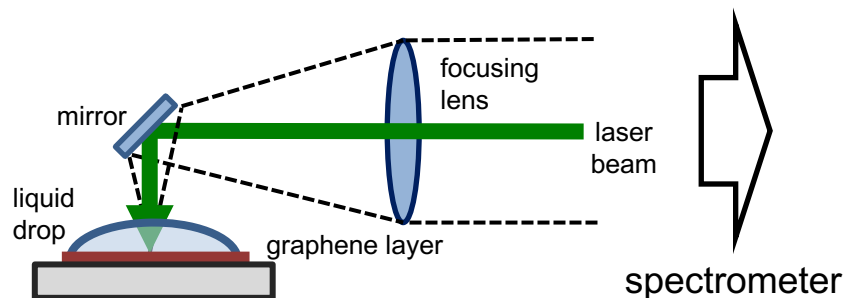


Macali A., Semenov A., Venuti V., Crupi V., D'Amico F., Rossi B., Corsi I., Bergami E.

Episodic records of jellyfish ingestion of plastic items reveal a novel pathway for trophic transference of marine litter
Scientific Reports, Vol. 8 - 1, pp. 6105 (2018)

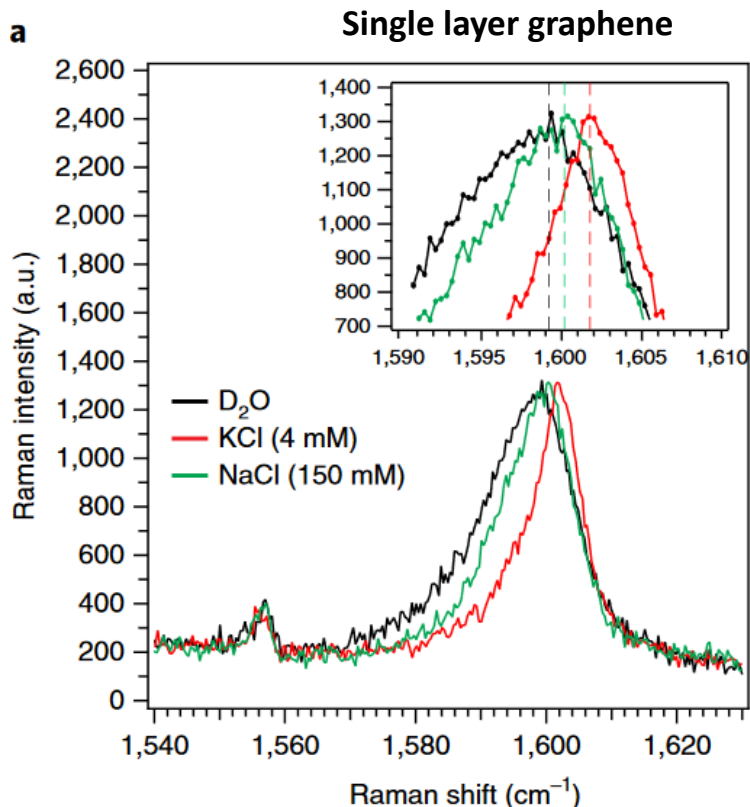


Esempio 2

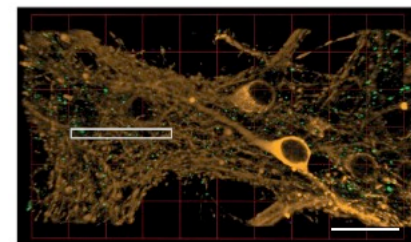


Single-layer graphene modulates neuronal communication and augments membrane ion currents

Niccolò Paolo Pampaloni^{1,14}, Martin Lottner^{2,14}, Michele Giugliano^{3,4,5}, Alessia Matruggio^{6,13}, Francesco D'Amico⁷, Maurizio Prato^{8,9,10}, José Antonio Garrido^{11,12*}, Laura Ballerini^{1*} and Denis Scaini^{1,7*}



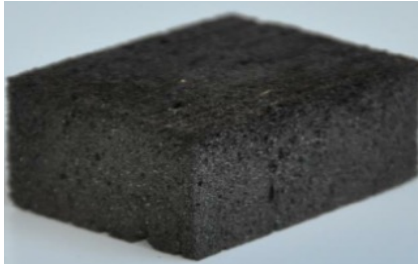
The ion implanting influences the neuronal network communication because of the presence of a membrane ion current



Nature Nanotechnology
volume 13, pages 755–764 (2018)

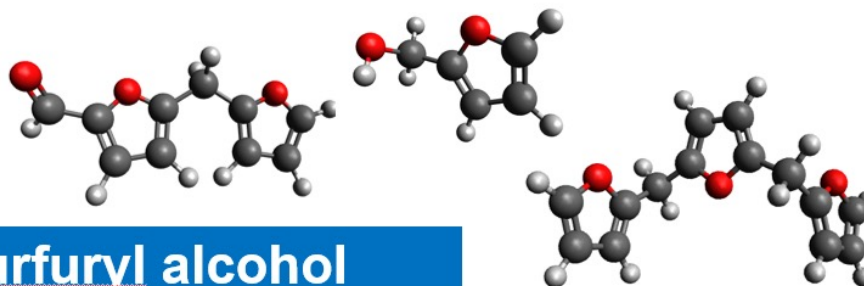
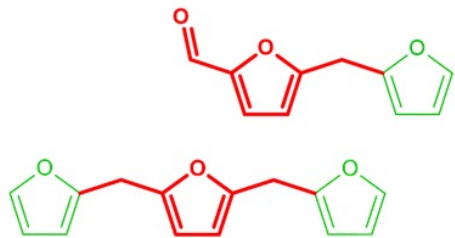
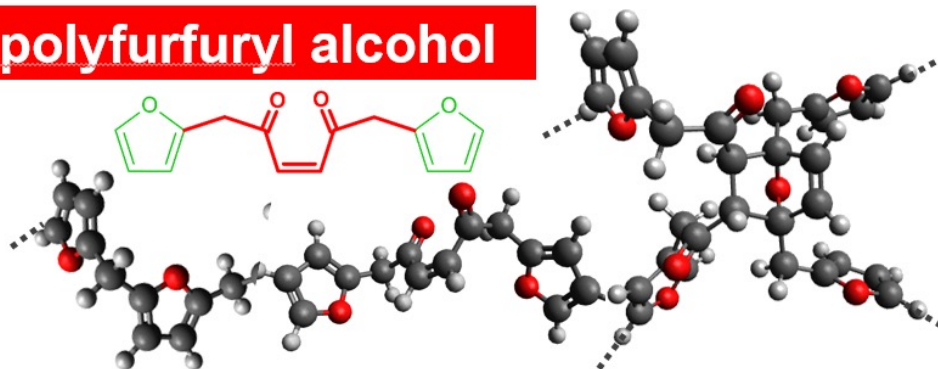
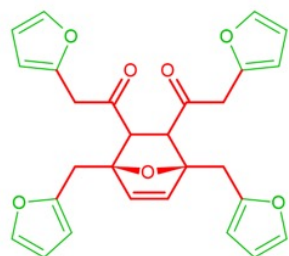
Esempio 3

Rigid Biofoams of tannin and
lignin

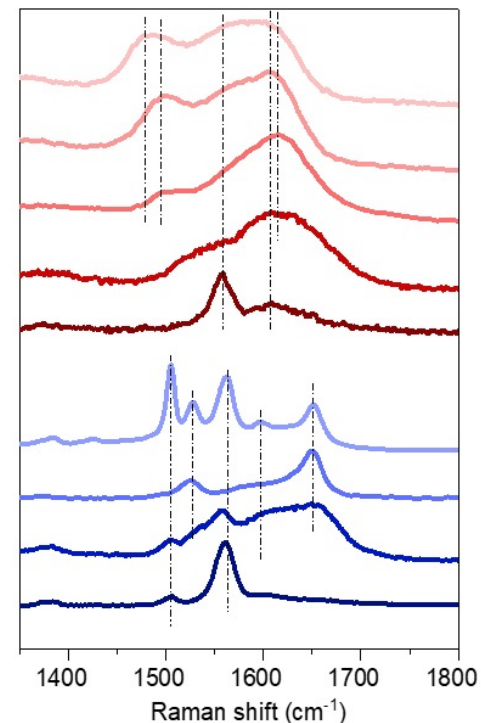


Esempio 3

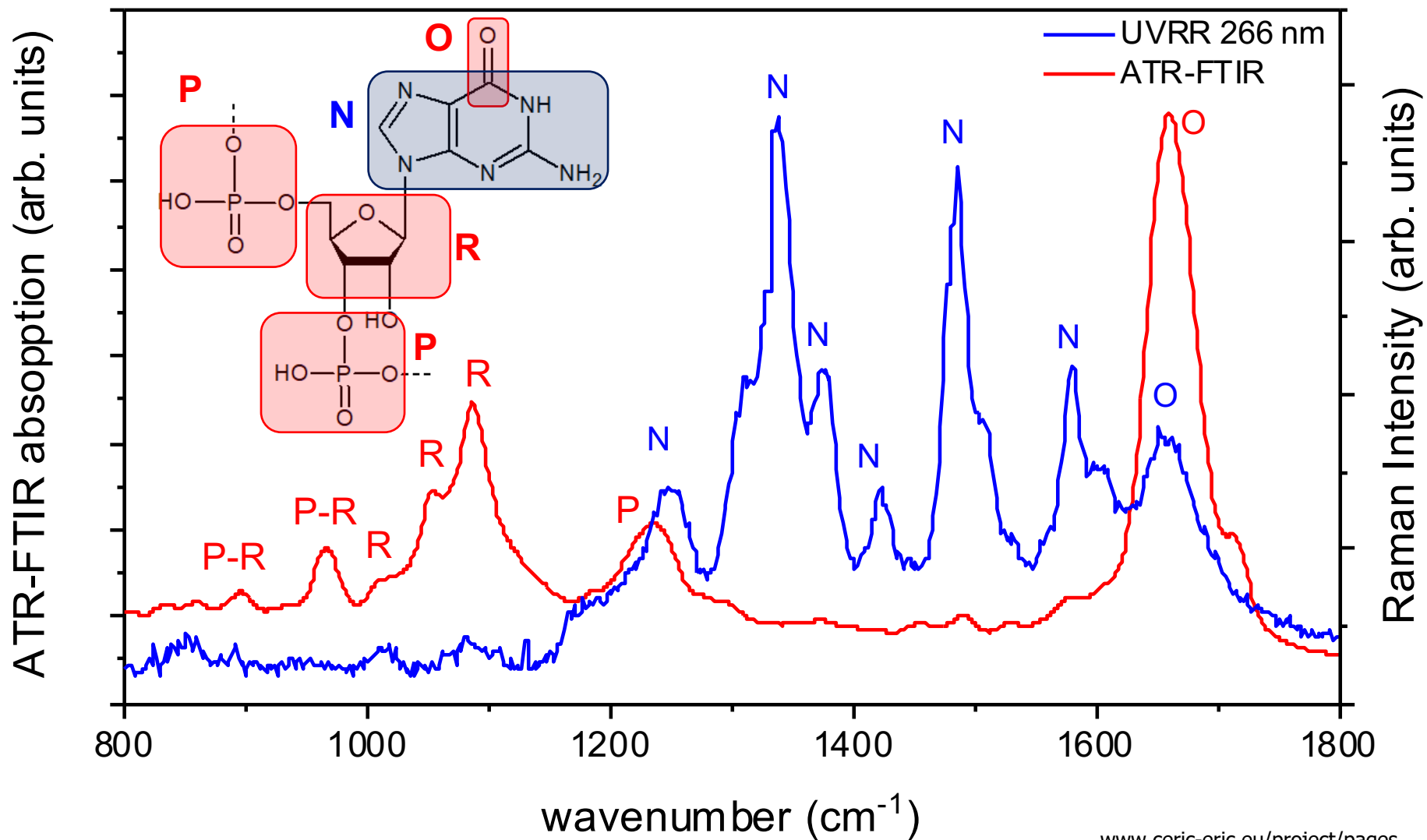
Thermosetted polyfurfuryl alcohol



Viscous polyfurfuryl alcohol



Esempio 4



CERIC

PaGES⁷

Planning,
Management and
Execution of a
Scientific Experiment in
an international research
infrastructure

Thank you

Contact details