9° edición de las JORNADAS DEL CUIA EN ARGENTINA

La investigación en BNCT entre Pavia y Buenos Aires

UNIVERSIDAD FAVALORO

20 Abril 2017

UNIVERSIDAD NACIONAL DE SAN MARTÍN 1992 25 2017

24 Abril 2017

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INFN – Unidad de Pavia

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CNEA

INFN Istituto Nazionale di Fisica Nucleare

UNIVERSITÀ DI PAVIA


Berna
Svizzera
E43
Losanna
Parco
Nazionale
dello Stelvio
Bolzano
Villaco
E62
E35
Trento
Udine
Zermatt
Chamonix-Mont-Blanc
Varese
Como
Bergamo
Treviso
E70
Trieste
Milano
Verona
Venezia
Parc national
de la Vanoise
E70
E45
Padova
E612
E35
Parenzo
Rovigno
Torino
Asti
Pola
Parma
E717
Modena
Bologna
Genova
Ravenna
Savona
Parc national
du Mercantour
La Spezia
Cesena
Rimini
San Marino
E76
Firenze
Nizza
Pisa
Ancona

Argentina: nice to meet you! 2007

Éste fue el primer intercambio de una larga serie que se mantiene hasta la actualidad.

In a workshop organized in Essen in the frame of the European Project for BNCT I met Mandy Schwint for the first time. I was a PhD student in my last year, and I wanted to spend some weeks in a foreign group to extend my PhD experience.

Mandy put me in contact with Marcelo Miller, who hosted me in his group working in the simulation of RA-3 reactor. In particular, I started working at the model of the Thermal Column that hosts a facility for explanted organ irradiation

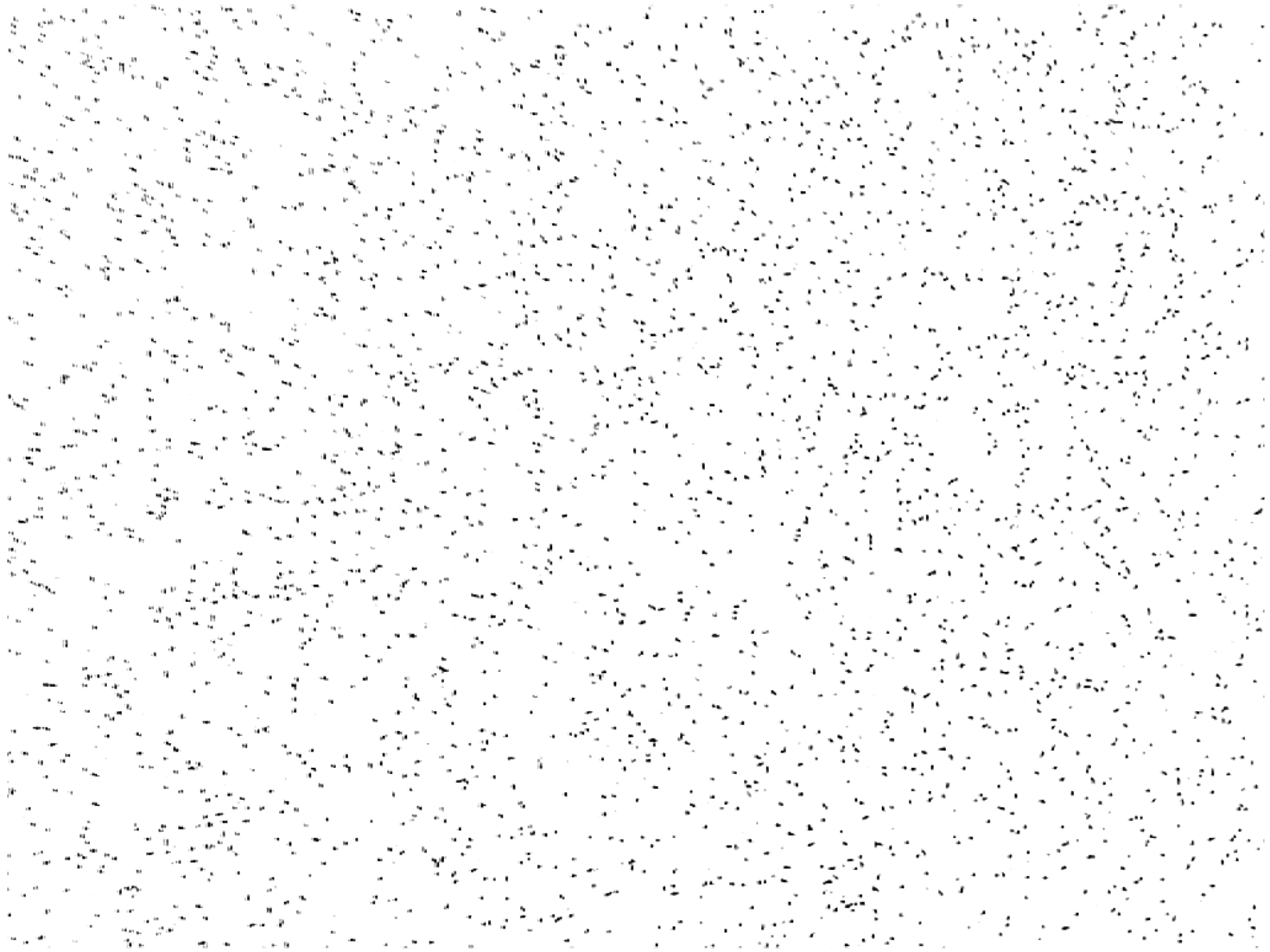
Saverio travelled to Buenos Aires in 2007: seminars about the ex-situ BNCT experience in Pavia. Great time in Buenos Aires!

2007: Bienvenido Mario!

Begins a series of exchanges of Argentinian students-researchers in Pavia. Short visits (1-2 months) supported by National Institute of Nuclear Physics

2008-2009: Mario takes a contract for 1.5 y

The contract was part of a grant (International Collaboration on BNCT), given by the Department of Physics



UNIVERSITA' DEGLI STUDI DI PAVIA

FACOLTA' DI SCIENZE MM. FF. NN.

DIPARTIMENTO DI FISICA NUCLEARE E TEORICA

CORSO DI LAUREA SPECIALISTICA IN SCIENZE FISICHE

UN SELF POWERED NEUTRON DETECTOR (SPND) COME MONITOR DI FLUENZA NELLA COLONNA TERMICA DEL REATTORE TRIGA MARK II DI PAVIA

Relatore:
Chiar.mo Prof. Saverio Altieri

Correlatore:
Ing. Mario Alberto Gadan

Tesi di Laurea di
Davide Santoro

Anno Accademico 2007/2008

Work

- Quantitative method to measure ^{10}B concentration by neutron autoradiography

- Effectiveness tests of new boronated carriers in vitro

- Characterization of SPND as a fluence monitor in the thermal column of the Triga Mark II reactor in Pavia
  - SPND donated by Instrumentacion y Control group to BNCT group in Pavia!
  - MSc thesis by Davide Santoro: supervisor S.Altieri, co-supervisor M.Gadan

2008: 13th International Congress on NCT in Florence!

International Congress on Neutron Capture Therapy
13th ICNCT
Florence
Italy
November 2 - 7, 2008

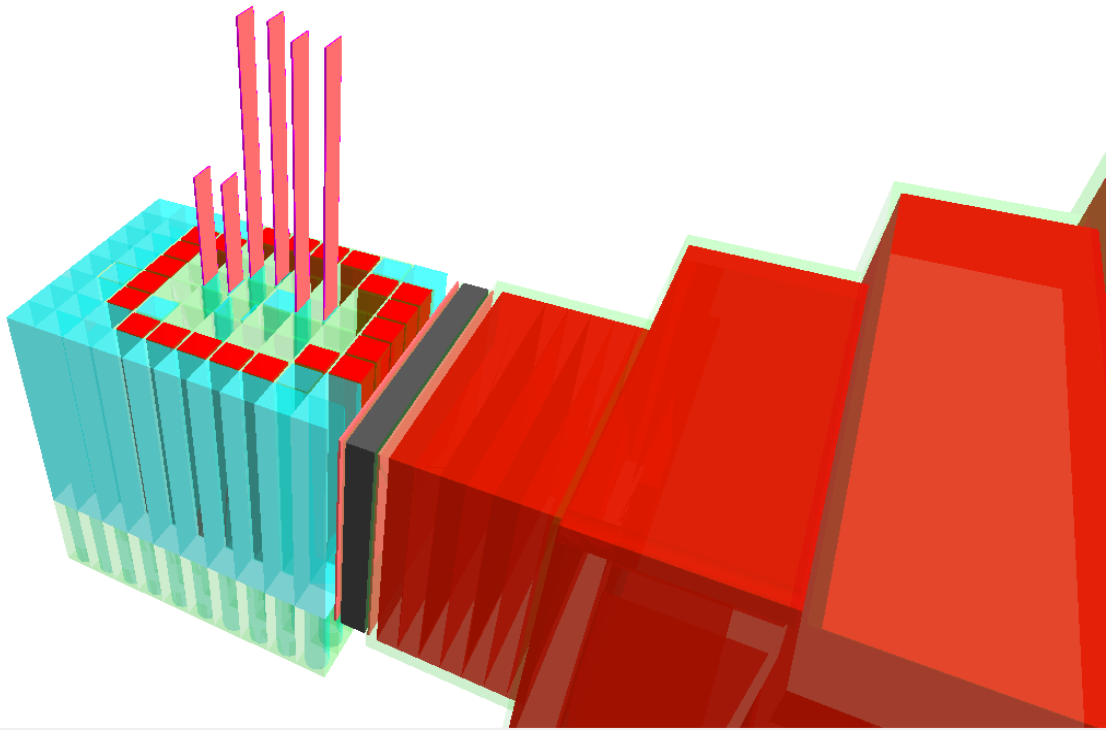
Silvia y Emiliano en Pavia!! 2008

- Calibration of SPND
- Work on experimental model of rat with lung metastases with biology group (Cinzia Ferrari) and with MD James Bakeine.

Agus en Pavia!! 2009

- Short visit and seminar on 10B measurements

2009: simulation of the RA-3 facility

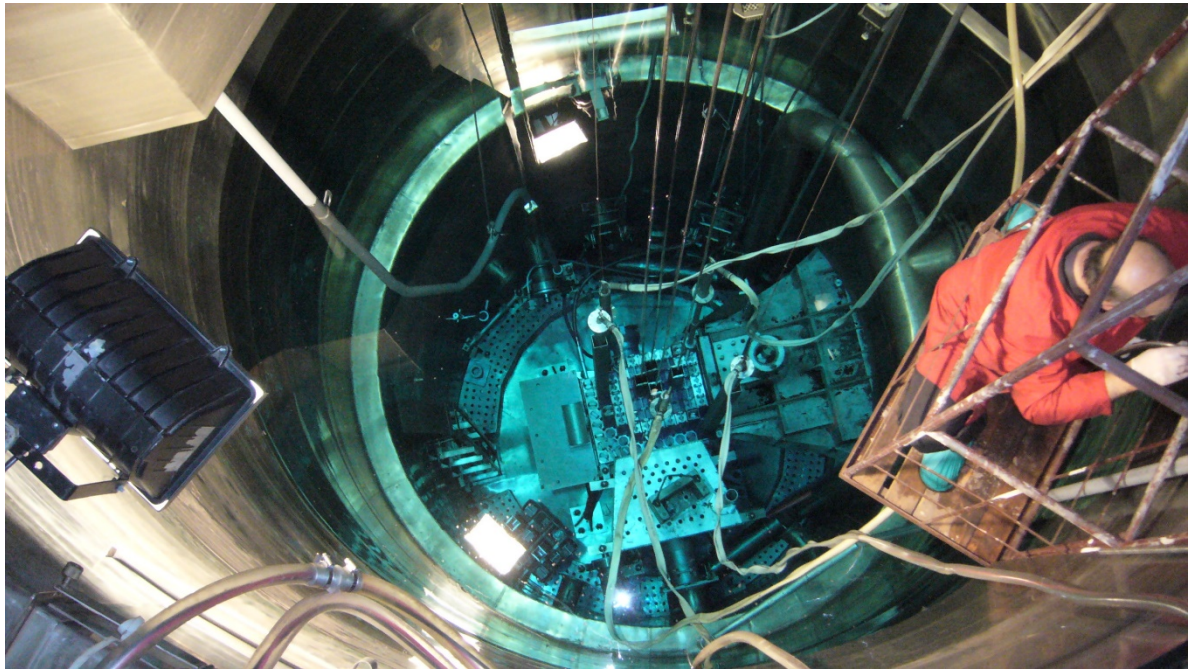


I travelled back to Argentina for 3 months. In this period the neutron source of RA-3 was modelled and validated with experimental measurements in the thermal column facility. I started working with Computational Dosimetry and Treatment Planning group, in particular with Ruben Farias and Sara Gonzalez

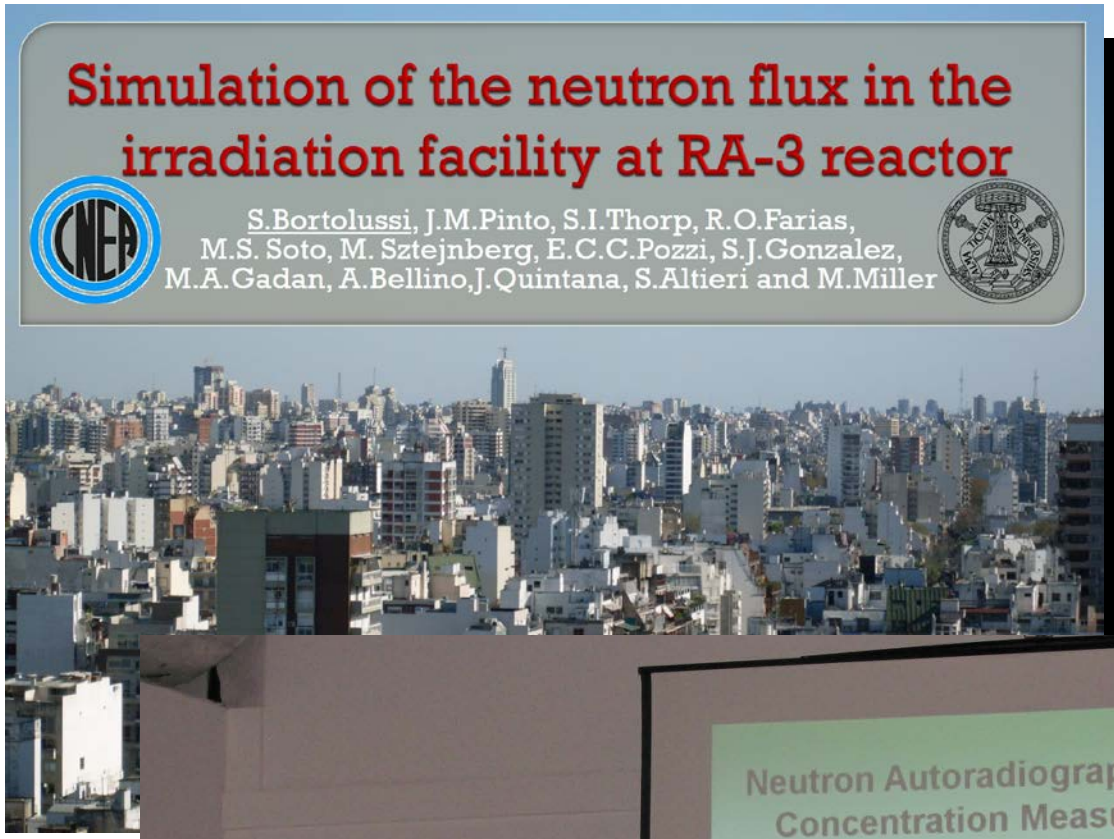
Entre Italia y Argentina…

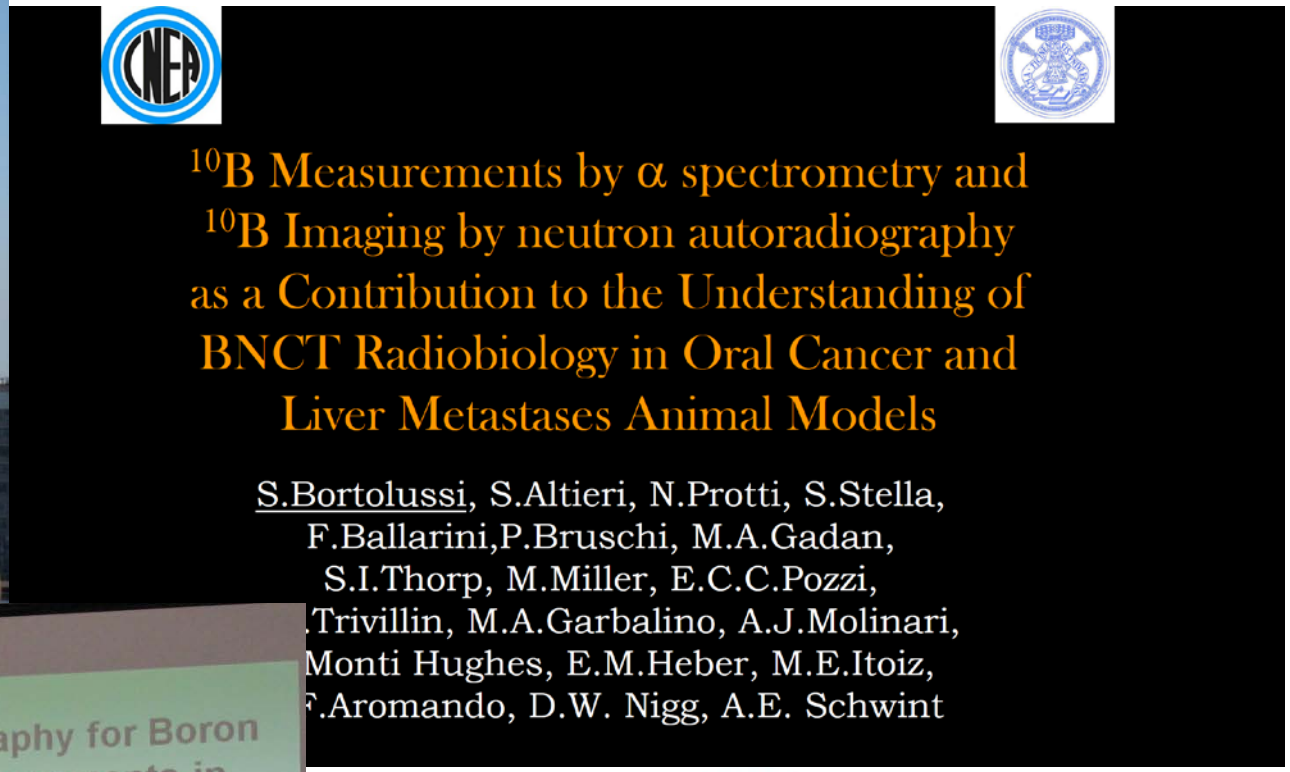
Intercomparison of B concentration measurements in a series of samples from different BNCT protocols and with different techniques.

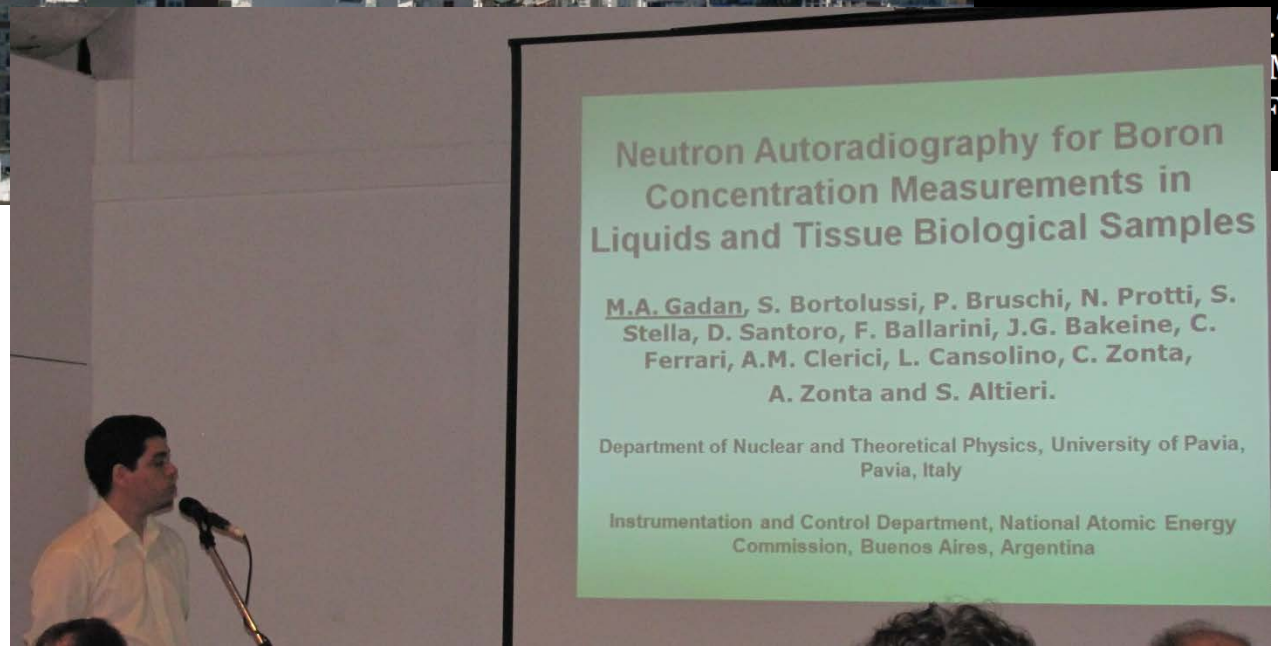
Very hard work (see Agustina Portu & Maria Silvia Olivera talks to understand why!!!)

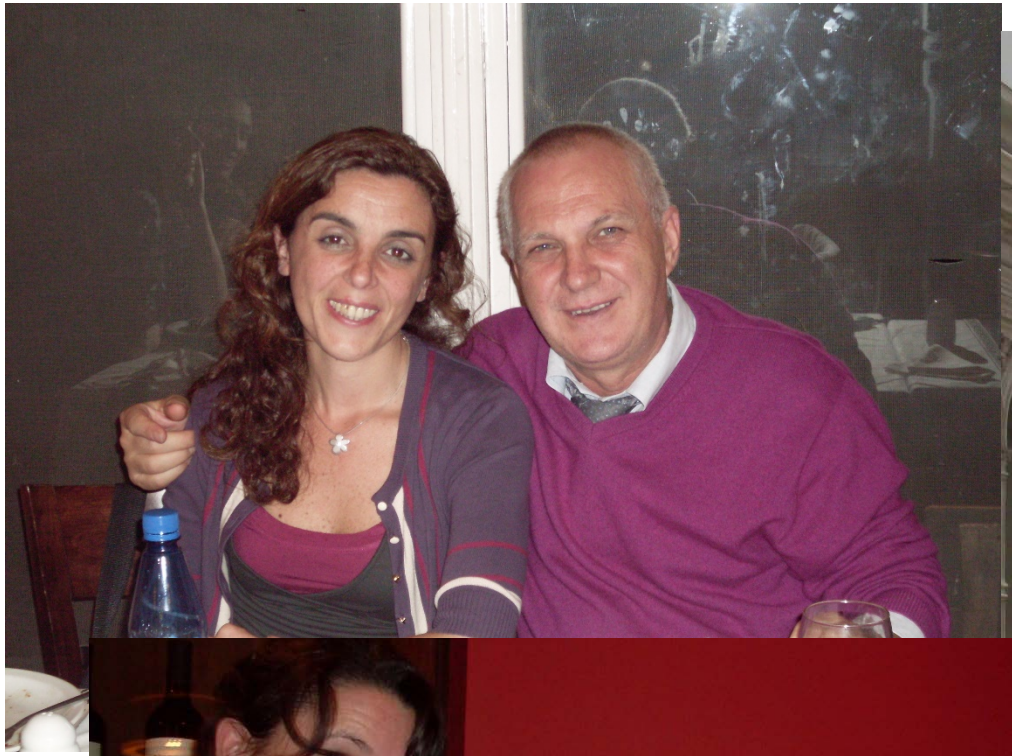


2010: 14th International Congress on NCT in Buenos Aires!



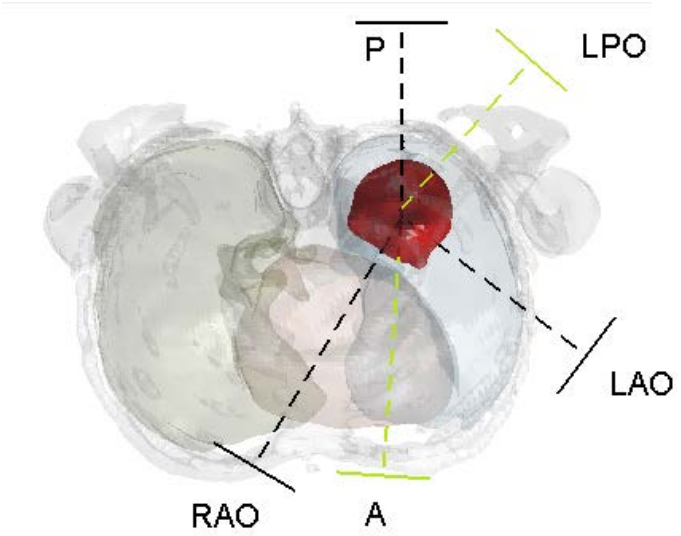


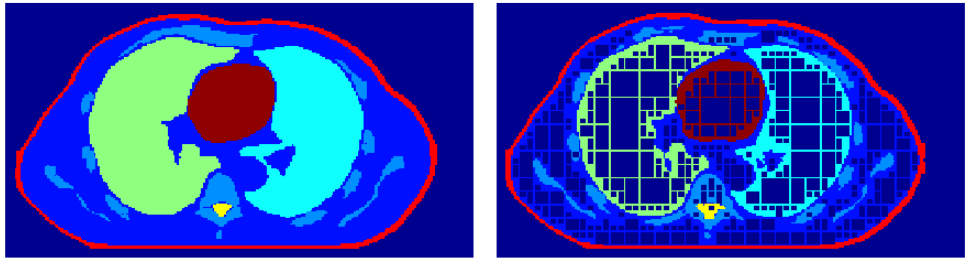




2011-2012: BNCT of Lung tumours

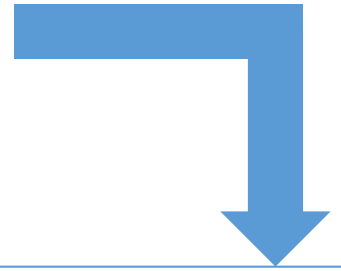
- Silva in Buenos Aires, CD & TP group
- Ruben and Sarita in Pavia
  - seminar on BNCT on skin melanoma + lectures on BNCT Treatment Planning for the MSc course «Simulations in medical physics», Department of Physics
- Mario in Pavia





2013: BNCT of Bone tumours

- Silva in Buenos Aires, CD & TP group
- Lucas in Pavia
  - Alpha spectrometry for hard tissues
- Sarita in Pavia



Lucas Provenzano
Doctorado en Ciencia y Tecnología, Mención Física
Instituto Sábato, UNSAM
Beca Doctoral CONICET

Investigación y Desarrollo en BNCT para el tratamiento de nuevas patologías

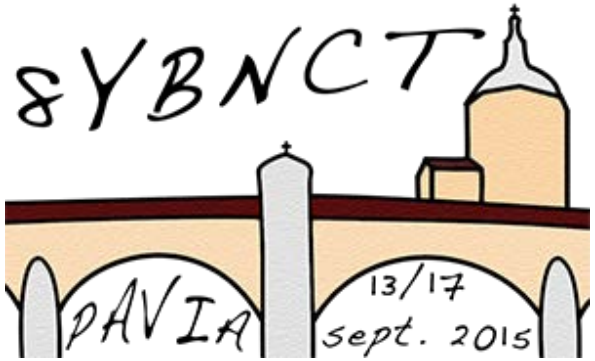
Supervisors: González - Bortolussi

2014

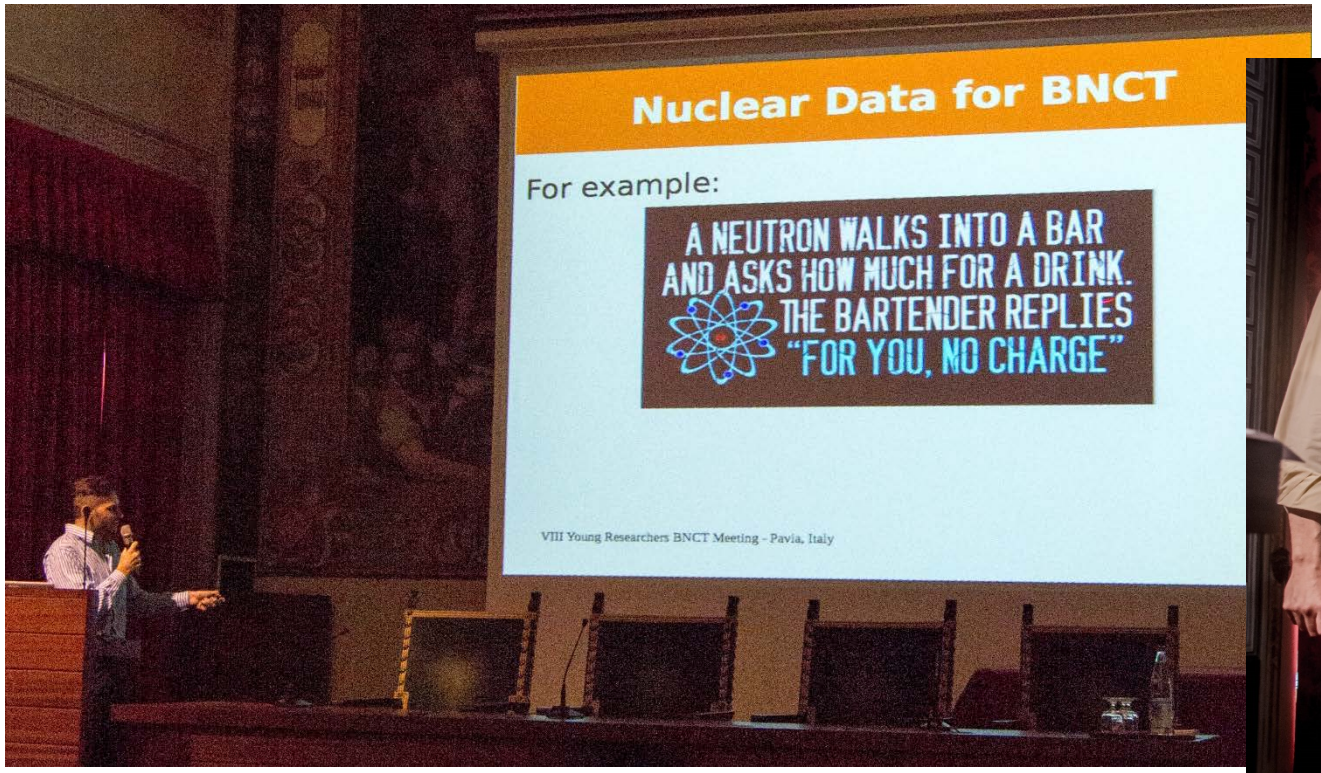
- Silva in Buenos Aires, CD & TP group
  - Maria Herrera y Maria Eugenia Capoulat PhD
  - Hanna Koivunoro – patients' dosimetry
- Lucas in Pavia
  - Alpha spectrometry for hard tissues
- Agus in Pavia
- Manuel in Pavia
  - Seminar on PGNAA

Italia-Argentina casi un solo grupo!

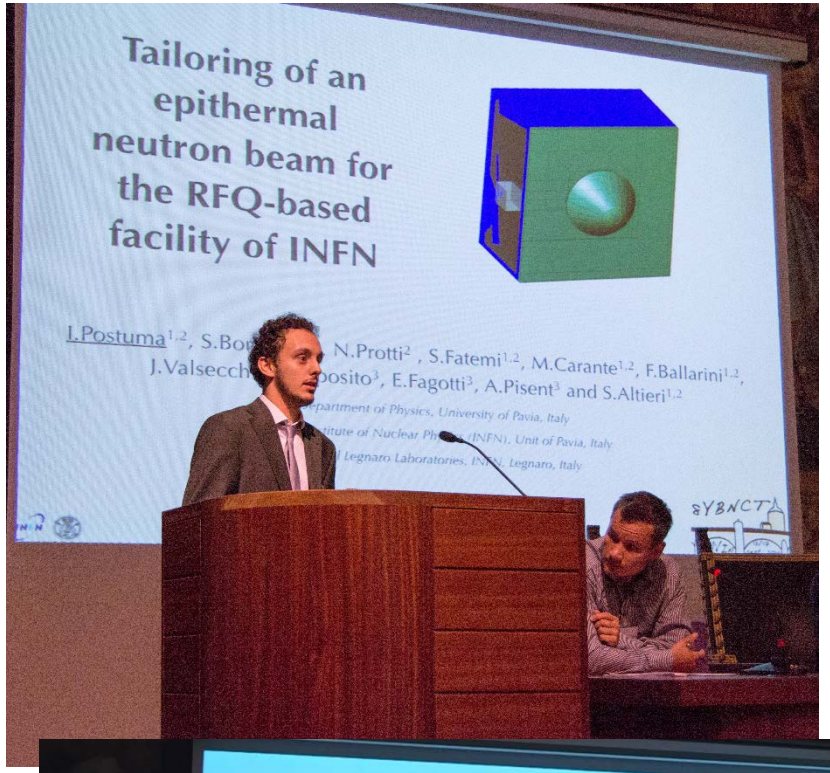
- Ricardo Ramos
  - Thermal neutron flux measurements in thermal column
- Lucila Rogulich
  - 6 months in Pavia as Erasmus student (exams + research)

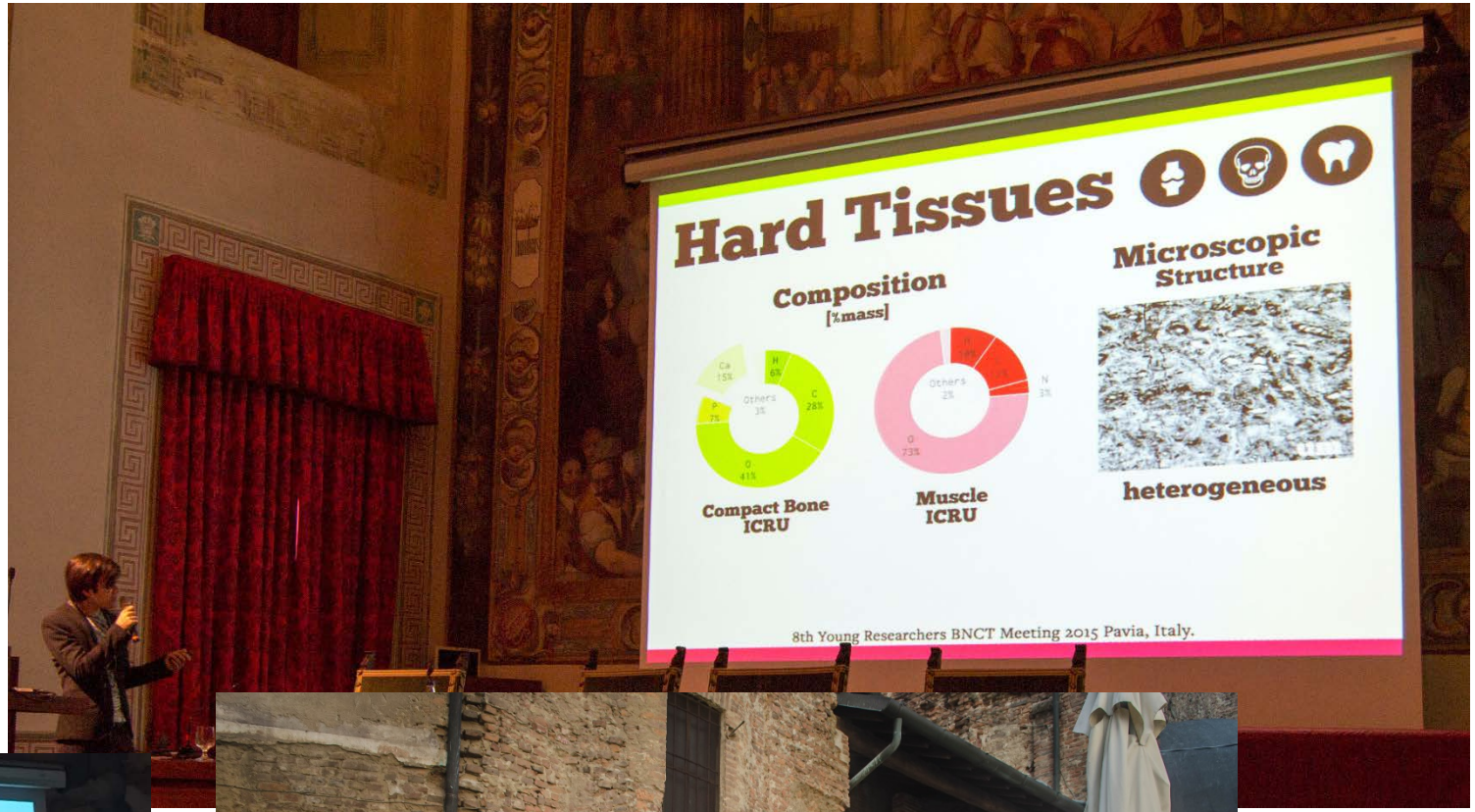


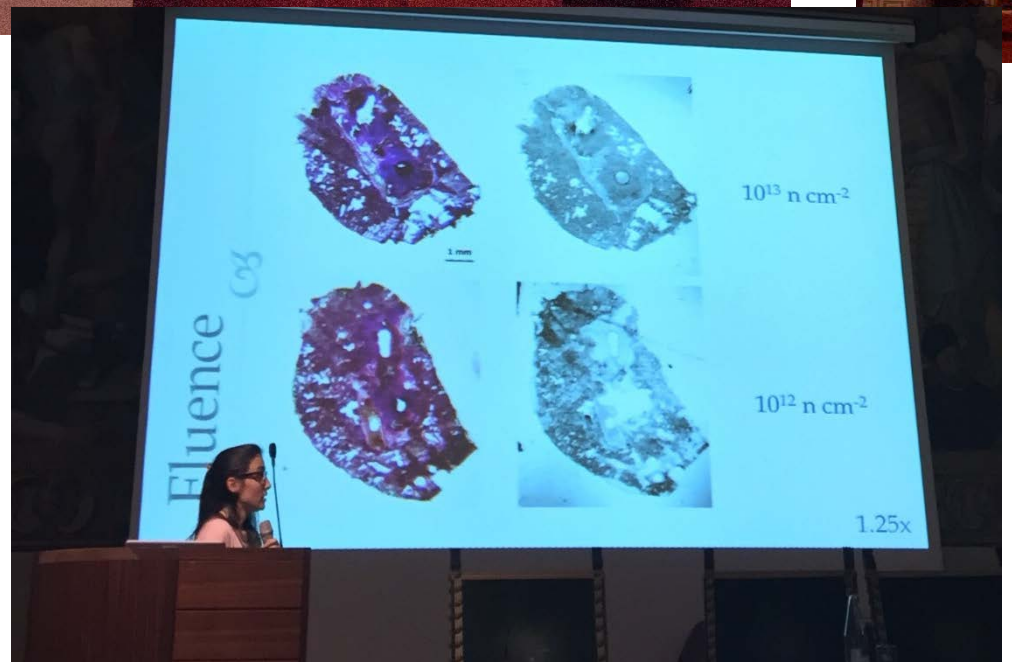
2015



1° Kent Riely Award

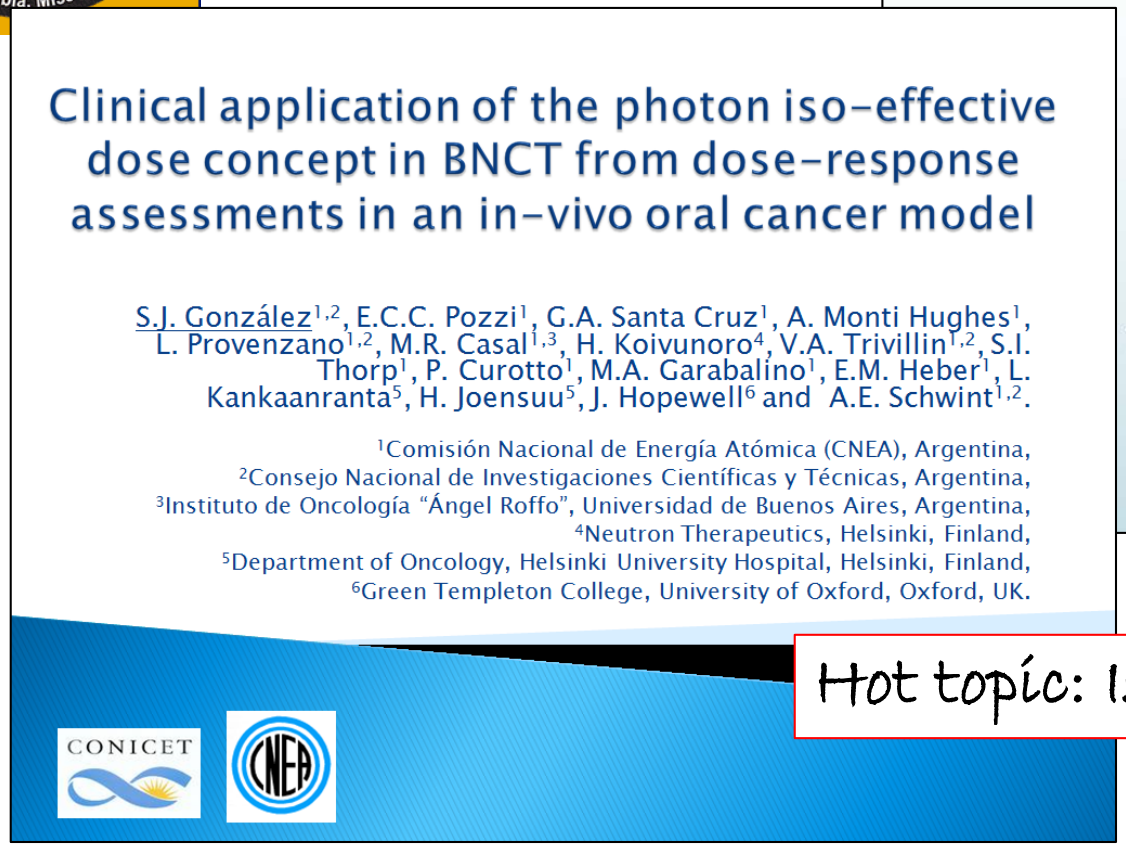

Tailoring of an epithermal neutron beam for the RFQ-based facility of INFN
I.Postuma[1,2], S.Bo N.Protti[2], S.Fatemi[1,2], M.Carante[1,2], F.Ballarini[1,2], J.Valsecch posito[3], E.Fagotti[3], A.Pisent[3] and S.Altieri[1,2]
epartment of Physics, University of Pavia, Italy
stitute of Nuclear Ph (INFN), Unit of Pavia, Italy
Legnaro Laboratories, INFN, Legnaro, Italy
8YBNCT


Hard Tissues
Composition
[%mass]
Compact Bone ICRU
Muscle ICRU
Microscopic Structure
heterogeneous
8th Young Researchers BNCT Meeting 2015 Pavia, Italy.


Eluence
10^{13} n cm^{-2}
10^{12} n cm^{-2}
1.25x

2016

- Lucas in Pavia
  - Alpha spectrometry measurements and simulations



Clinical application of the photon iso-effective dose concept in BNCT from dose-response assessments in an in-vivo oral cancer model

S.J. González[1,2], E.C.C. Pozzi[1], G.A. Santa Cruz[1], A. Monti Hughes[1], L. Provenzano[1,2], M.R. Casal[1,3], H. Koivunoro[4], V.A. Trivillin[1,2], S.I. Thorp[1], P. Curotto[1], M.A. Garabalino[1], E.M. Heber[1], L. Kankaanranta[5], H. Joensuu[5], J. Hopewell[6] and A.E. Schwint[1,2].

[1]Comisión Nacional de Energía Atómica (CNEA), Argentina,
[2]Consejo Nacional de Investigaciones Científicas y Técnicas, Argentina,
[3]Instituto de Oncología "Ángel Roffo", Universidad de Buenos Aires, Argentina,
[4]Neutron Therapeutics, Helsinki, Finland,
[5]Department of Oncology, Helsinki University Hospital, Helsinki, Finland,
[6]Green Templeton College, University of Oxford, Oxford, UK.

CONICET

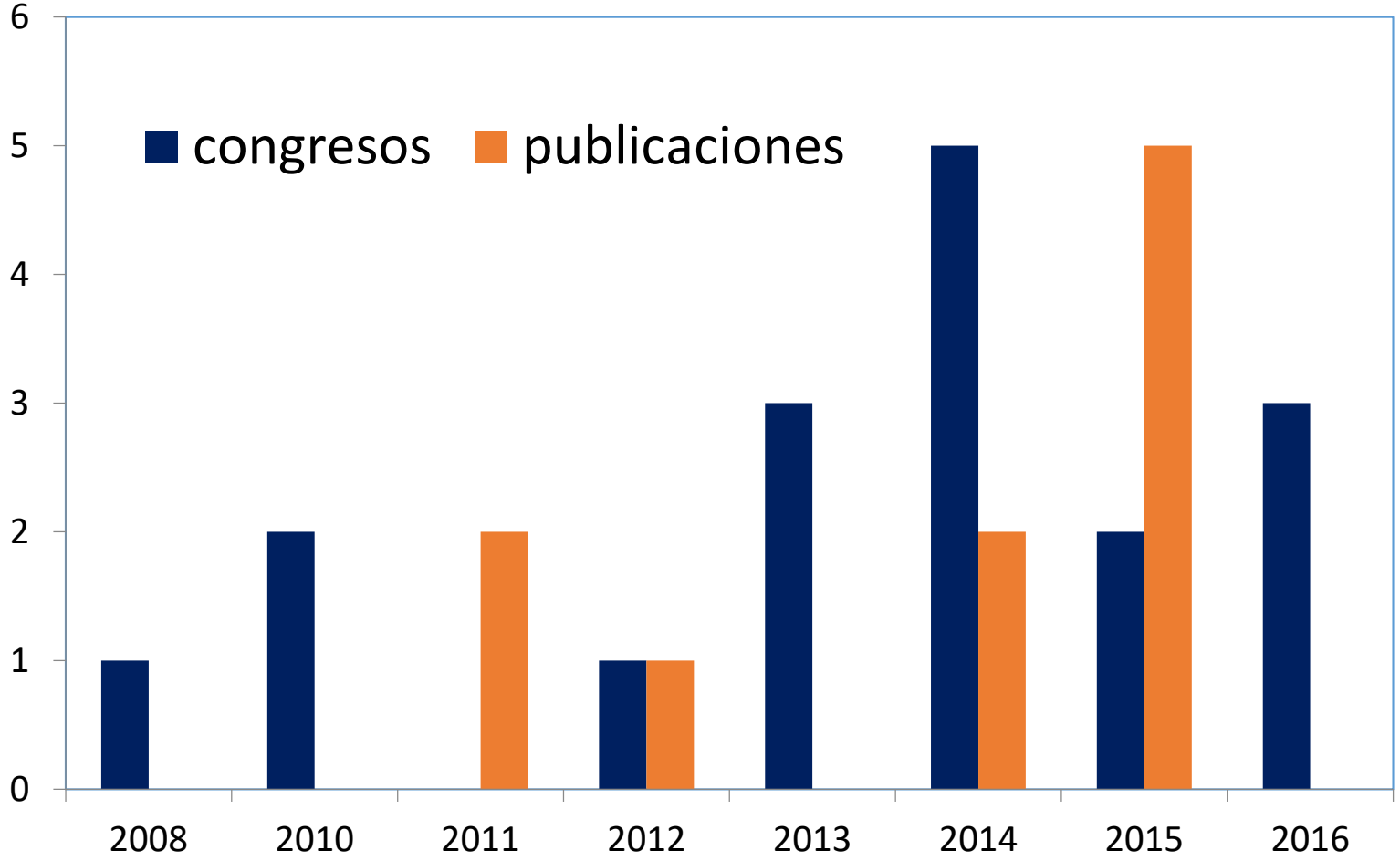
Feasibility Study of BNCT for the Treatment of Osteosarcoma

S.Bortolussi, S.Gonzalez, I.Postuma, S.Altieri, N.Protti, L.Provenzano, C.Ferrari, L.Cansolino, A.Clerici, O.Galasso, G.Gasparini, and S.Miyatake

ICNCT-17, 02-08 October 2017, Columbia, Missouri, USA

Hot topic: Isoeffective dose by Sara González

Presentations in congresses and publications in International journals



Acuerdo marco INFN-CNEA

SI RAFFORZA L'ALLEANZA ITALIA-ARGENTINA PER LA RICERCA IN FISICA FONDAMENTALE E APPLICATA

Pubblicato: 16 Novembre 2015

Due importanti passi compiuti negli ultimi giorni da Italia e Argentina intensificano la collaborazione esistente tra i due Paesi nel campo della fisica nucleare e astroparticellare, confermando i preziosi risultati ottenuti e l'impegno per i prossimi anni.

Riuniti all'Ambasciata italiana a Buenos Aires, i rappresentanti della Comisión Nacional de Energía Atómica (CNEA) e dell'Istituto Nazionale di Fisica Nucleare, hanno siglato un accordo di collaborazione per la ricerca in fisica nucleare, particellare e astro particellare. L'intesa prevede la cooperazione scientifico-tecnologica per attività di ricerca fondamentale e applicata e lo sviluppo di iniziative di trasferimento tecnologico nei settori del computing avanzato, dello sviluppo e applicazione degli acceleratori di particelle e della medicina nucleare. Per la prima volta, in particolare, la collaborazione tra i due paesi prevede la ricerca congiunta per lo sviluppo di applicazioni della fisica nucleare alla medicina, grazie alla collaborazione esistente tra INFN di Pavia e CNEA nella ricerca sulla tecnica BNCT (Boron Neutron Capture Therapy) per la terapia oncologica. "La firma dell'accordo", ha commentato il presidente dell'INFN, Fernando Ferroni, "consentirà di intensificare la fruttuosa collaborazione esistente tra CNEA e INFN sulla ricerca nel campo della BNCT e di estendere la cooperazione ad altri campi, facilitando inoltre lo scambio di giovani ricercatori."

MoU UnSAM - UniPV

(double titles, students exchanges, participation to grants, fellowships…)

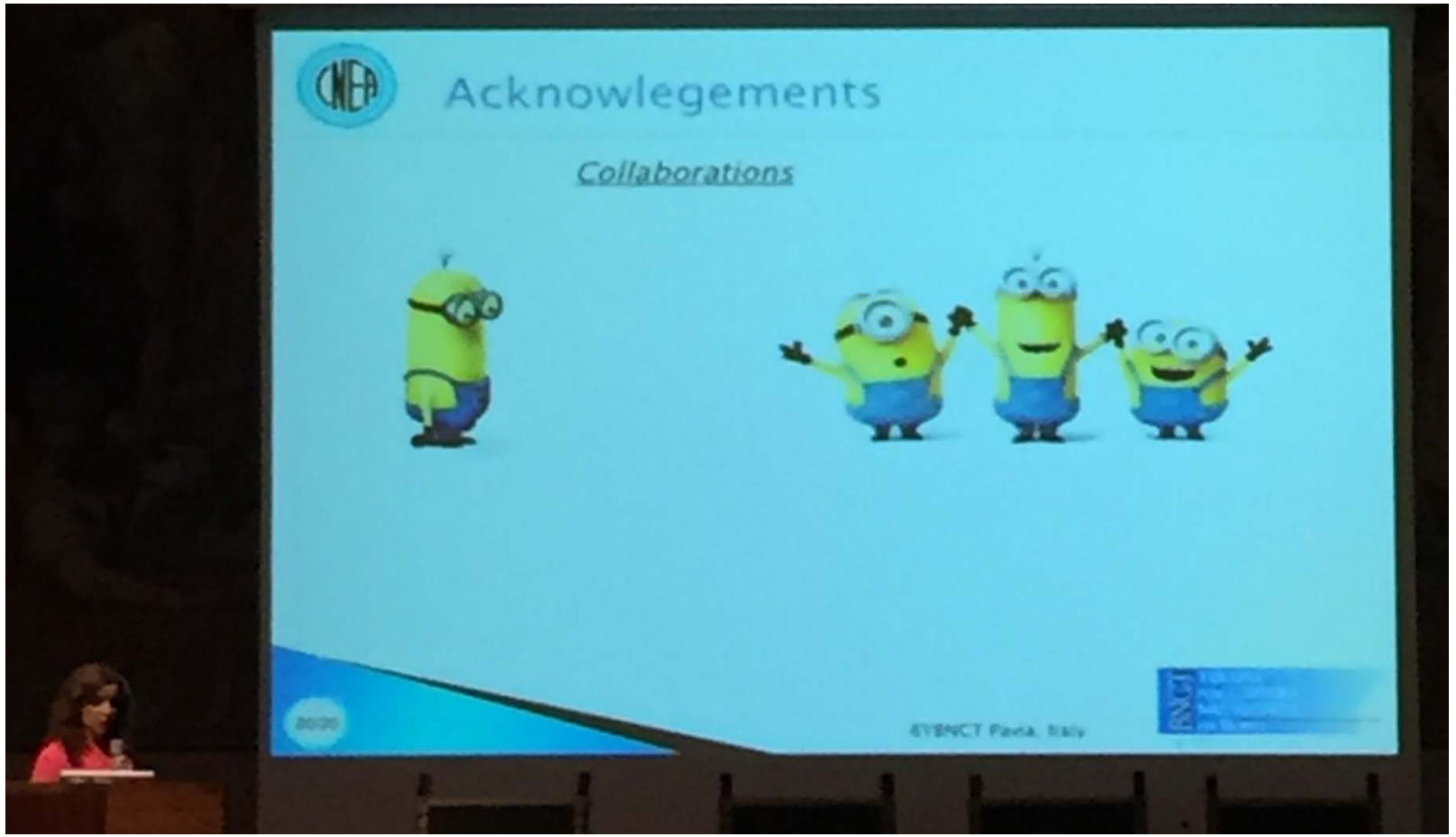
MoU UF – UniPV (under discussion)

Grants

PICT 2013 1777: Terapia por Captura Neutrónica en Boro (BNCT) para un tratamiento novel de metástasis múltiples en pulmón: estudio de BNCT ex-situ en oveja y estudio de BNCT in-situ en rata.
Responsables: Dra. Sara González- Dra. Verónica Trivillin.

PIP 2014-2016 GI: Investigación y desarrollo en BNCT para el tratamiento de nuevas patologías.
Responsable: Dra. Sara González.

INC 2015: Estudios Experimentales y Preclínicos de Captura Neutrónica en Boro (BNCT) orientados al Tratamiento de Cáncer de Cabeza y Cuello en Humanos.
Responsable: Dra. Amanda Schwint.



Silva Bortolussi

Departamento de Física - Universidad de Pavia

INFN – Unidad de Pavia

Italia

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www.bnct.it

Gracias Argentina!