



中华人民共和国科学技术部  
Ministry of Science and Technology of the People's Republic of China



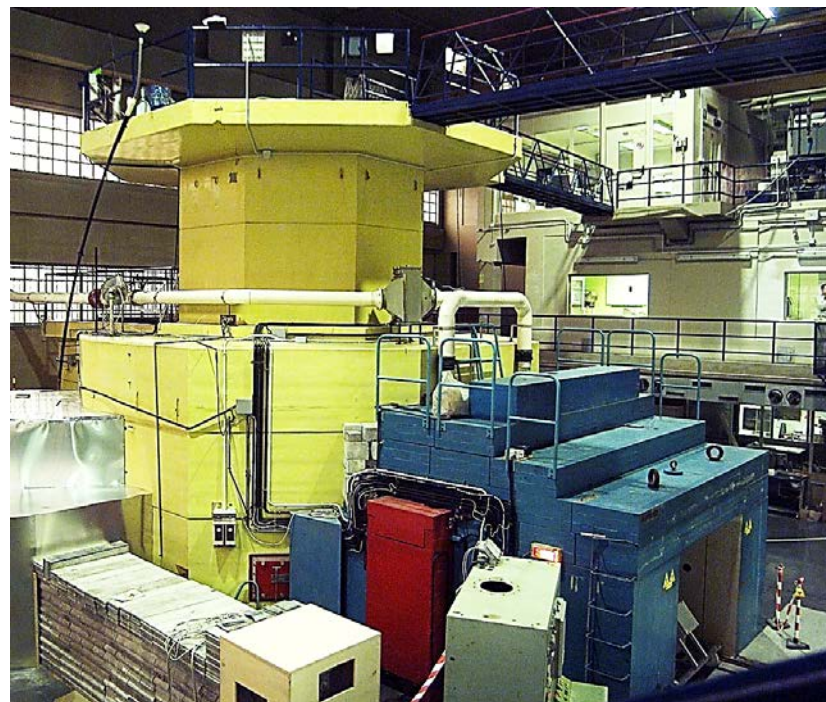
# NEU\_BEAT

*Results and Trajectories*

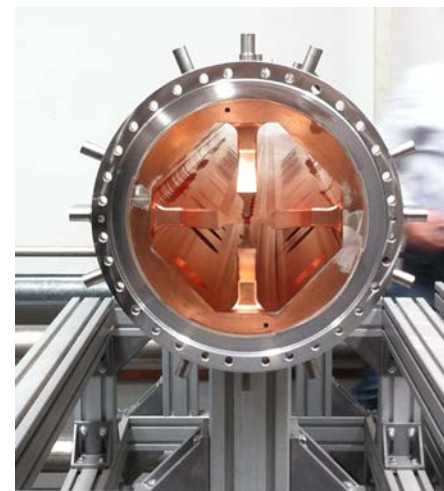
SILVA BORTOLUSSI  
ROME – 6 7 DECEMBER 2018  
NEU\_BEAT WORKSHOP  
INFN HEADQUARTERS



# NEUtron Beams for cAncer Therapy



From the experience ...



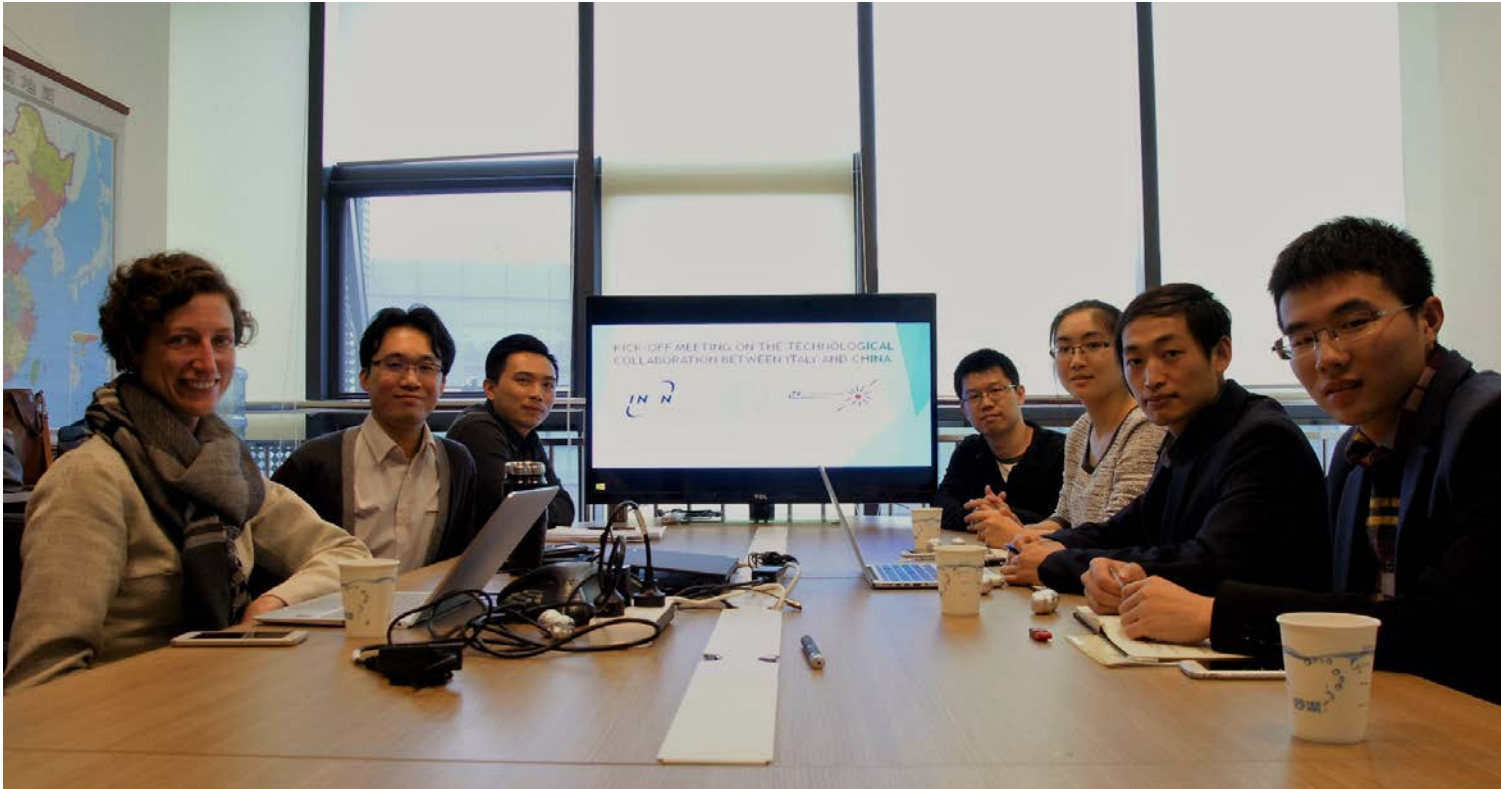
To BNCT with accelerators  
in clinical environments





# Kick-start meeting in Nanjing - 2016

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Meet **Chunhui Gong** working in SPECT for BNCT dose monitoring

Chunhui 6 months visiting period in Pavia

**Setareh Fatemi** 3 months visiting period in Nanjing

Chunhui won a post-doc position in a public competition @INFN-Pavia for 2 years

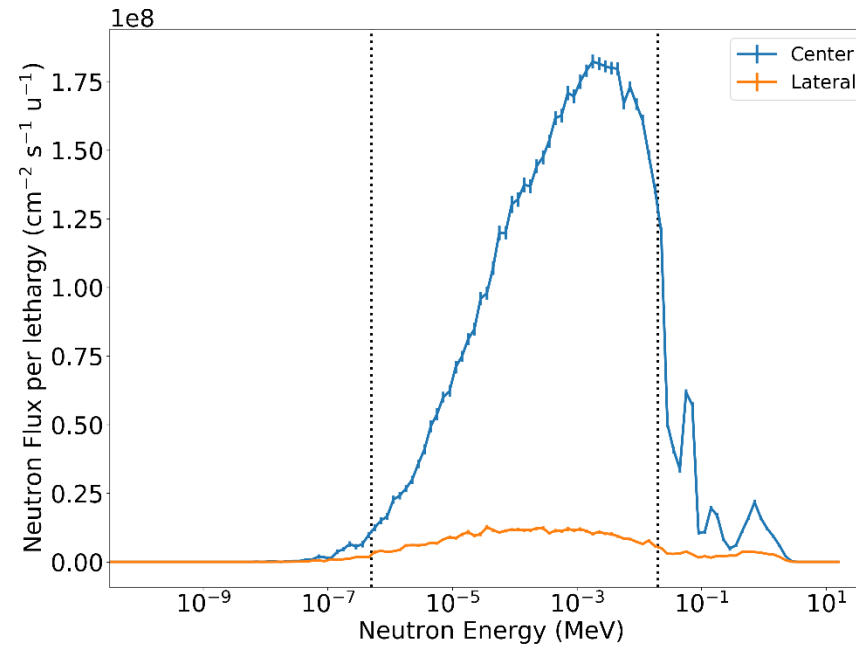
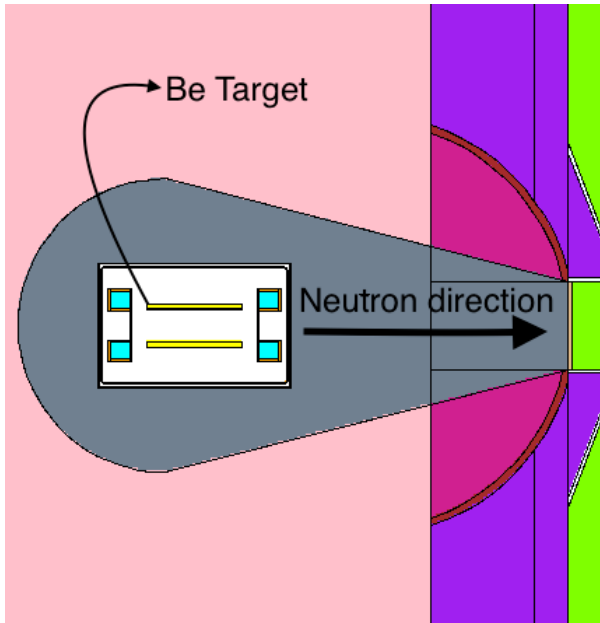
See talks by Protti, Gong, Fatemi tomorrow

**1.** Design and evaluation of the neutron beam

**2.** Optimization of the treatment

**3.** Combination of BNCT and Carbon Ion Therapy

# 1. Design and evaluation of the neutron beam

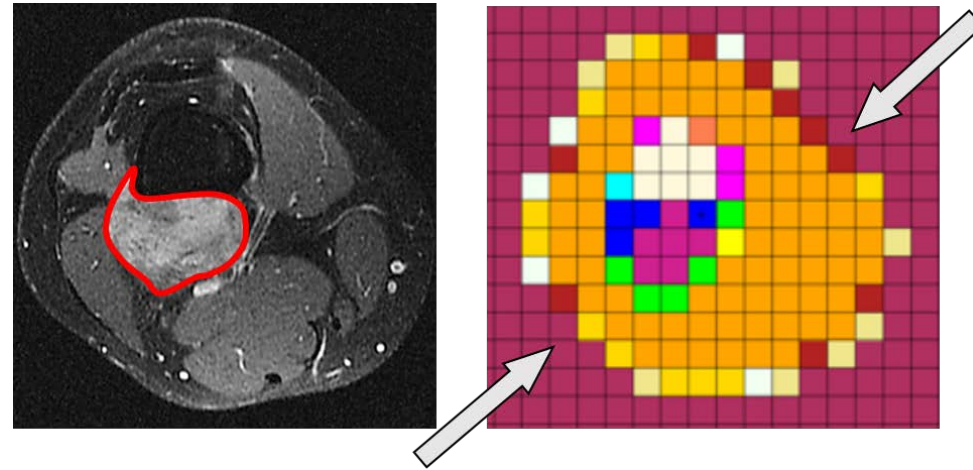
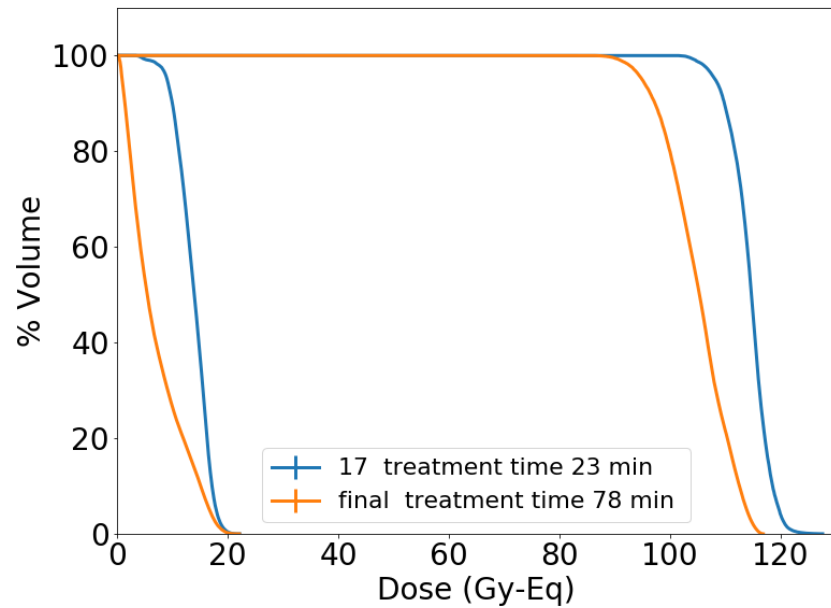


Core of Aluminum Fluoride + Lithium produced in Pavia by sintering

**ALLIFLU - PATENT SUBMITTED**

*See talk by V. Vercesi tomorrow*

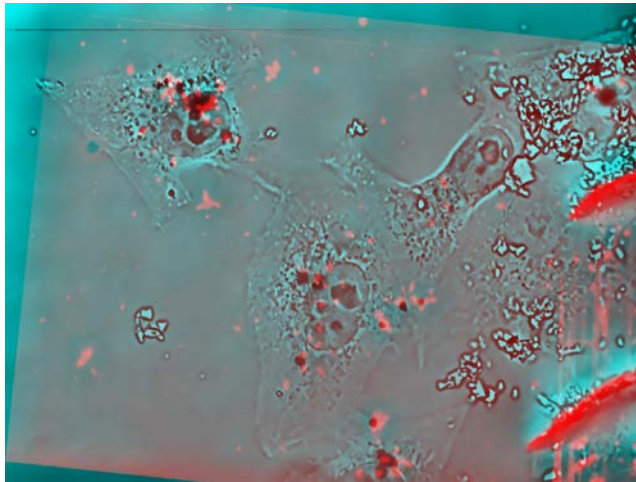
# 1. Design and evaluation of the neutron beam



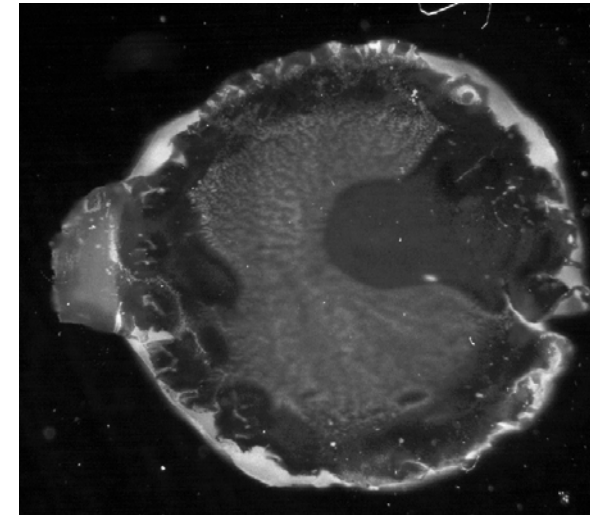
International effort to update the evaluation criteria for a more effective BNCT.  
Guideline revision chaired by **Yuan-Hao Liu**

## 2. Optimization of the treatment

Where does the boron go?



How can we better spare the normal tissues?



**Diyun Shu** 6-months visiting period in Pavia

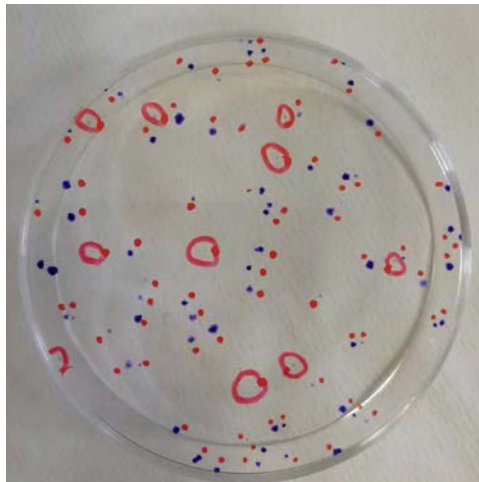
*See talk by Ian Postuma tomorrow*



## 2.

# Optimization of the treatment

New boron carriers for a more efficient BNCT



Jing He 1.5-months visiting period in Pavia



## BNCT @ CNAO

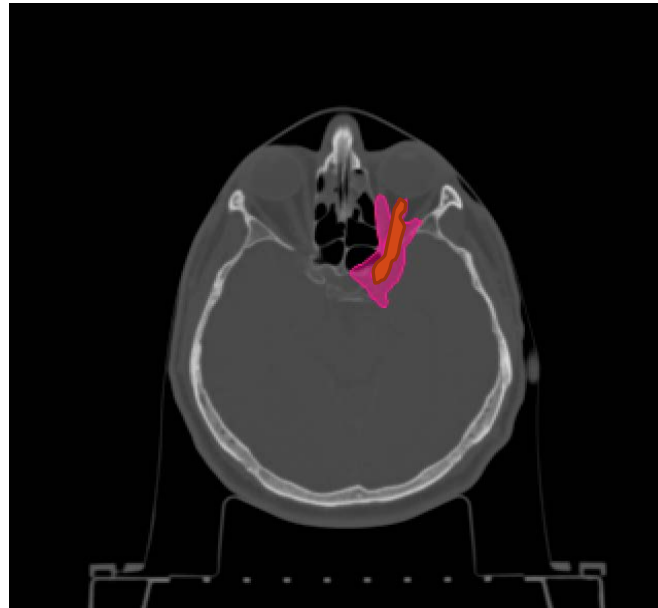
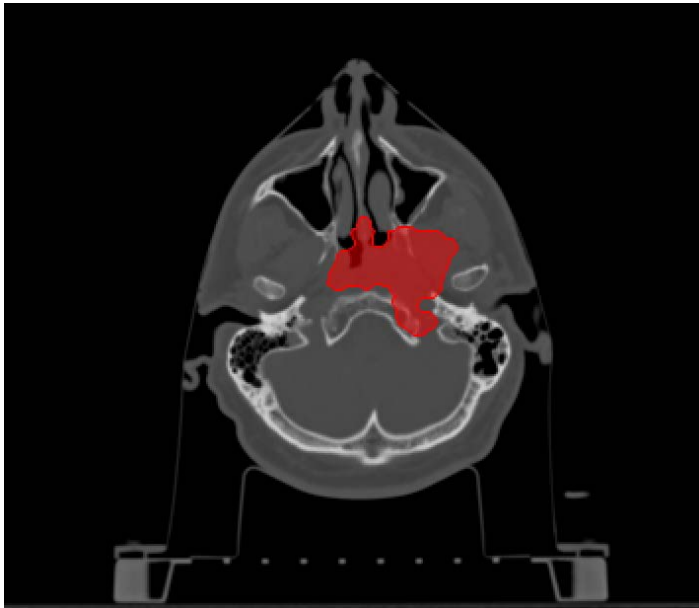


Charged particle therapy & BNCT in the same centre:

- best therapy according to tumour type
- combination of treatments

*See talk by Sandro Rossi later*

### 3. Combination of BNCT and Carbon Ion Therapy



1

What if the patient had been treated with BNCT as the first option?

2

What if the patient is directed to BNCT to treat the recurrence?

3

What if a combined BNCT+C-12 had been planned at the beginning?

Ian Postuma and myself- 1.5 months visiting period in Najing



Ian Postuma seminar @NUAA



Chunhui and Changran's new house inauguration



Simulations in medical physics – NUAA summer school



# NEU\_BEAT in numbers

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6 collaboration workshops

6 visiting research exchanges

1 university lecture exchange

1 BNCT forum in Nanjing

10 presentations at International Congresses

4 scientific publications

7 patents (1 Italy – 6 China)

5 presentations at the Ministries and Embassies

3 Italy-China weeks

1 Cooperation Agreement NUAA-UniPV

# Trajectories: where are we going?

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## Research & Technology

Develop BNCT clinical centres with shared tech and approaches

Coordinated preclinical studies and R&D (joint labs)

Patients management & statistics

Combined treatments



## Education

Exchange of students

Exchange of lecturers

Set-up of joint courses

PhD programs

Virtual labs and online courses

# Special Thanks

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**Farnesina**  
Ministero degli Affari Esteri  
e della Cooperazione Internazionale

and



中华人民共和国科学技术部  
Ministry of Science and Technology of the People's Republic of China

for offering the opportunity to realize our ideas



for the support in every way, in particular Direction, Admin and  
Mechanical workshop services



UNIVERSITÀ  
DI PAVIA

fondazione **CNAO**  
Centro Nazionale di Adroterapia Oncologica

for working and believing in this project



For being very special partners in this adventure.  
My special thanks to Yuan-Hao Liu



沈上歸律噫燭玉金朝安買碧花晚白蕩遠欲山問東春  
路斯嘻把龍女博見得醉假邊煙雲漾看鳴色蘭園風未  
遙沿東杜黃衙嬌明花一花疏高不千不不不不不不不不  
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