

European Network for Light Ion Hadron Therapy ENLIGHT



D'où Venons Nous / Que Sommes Nous / Où Allons Nous (Paul Gauguin)

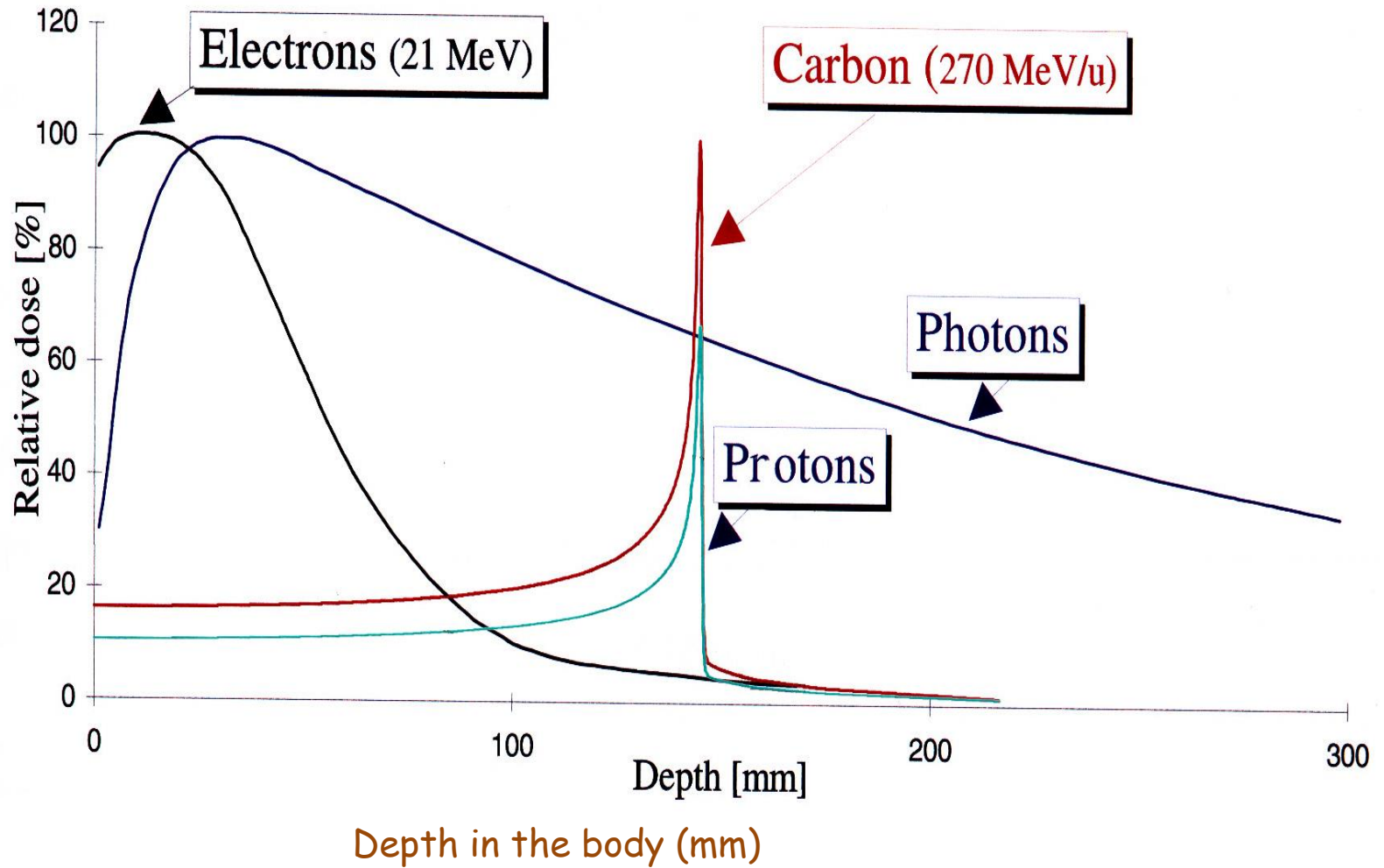
Manjit Dosanjh, IPPOG
23 May 2019

Why Cancer and Physics Technologies?

It is a large and a growing societal challenge:

- More than 3 million new cancer cases in Europe in 2015
- Nearly 15 million globally in 2015
- This number will increase to 25 million in 2030
- Currently around 8 million deaths per year

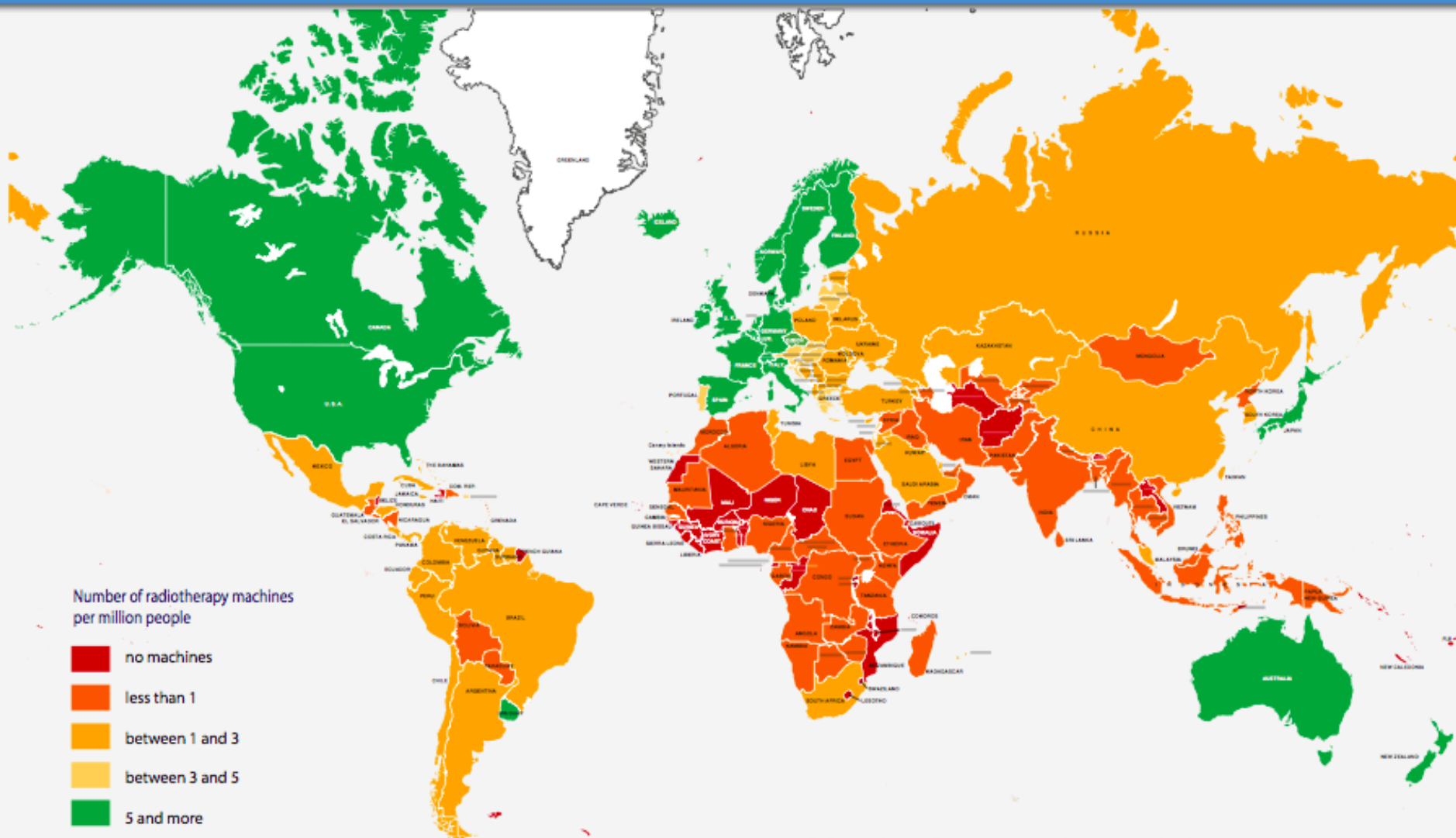
Radiation therapy



Availability of **RADIATION THERAPY**

Number of Radiotherapy Machines per Million People

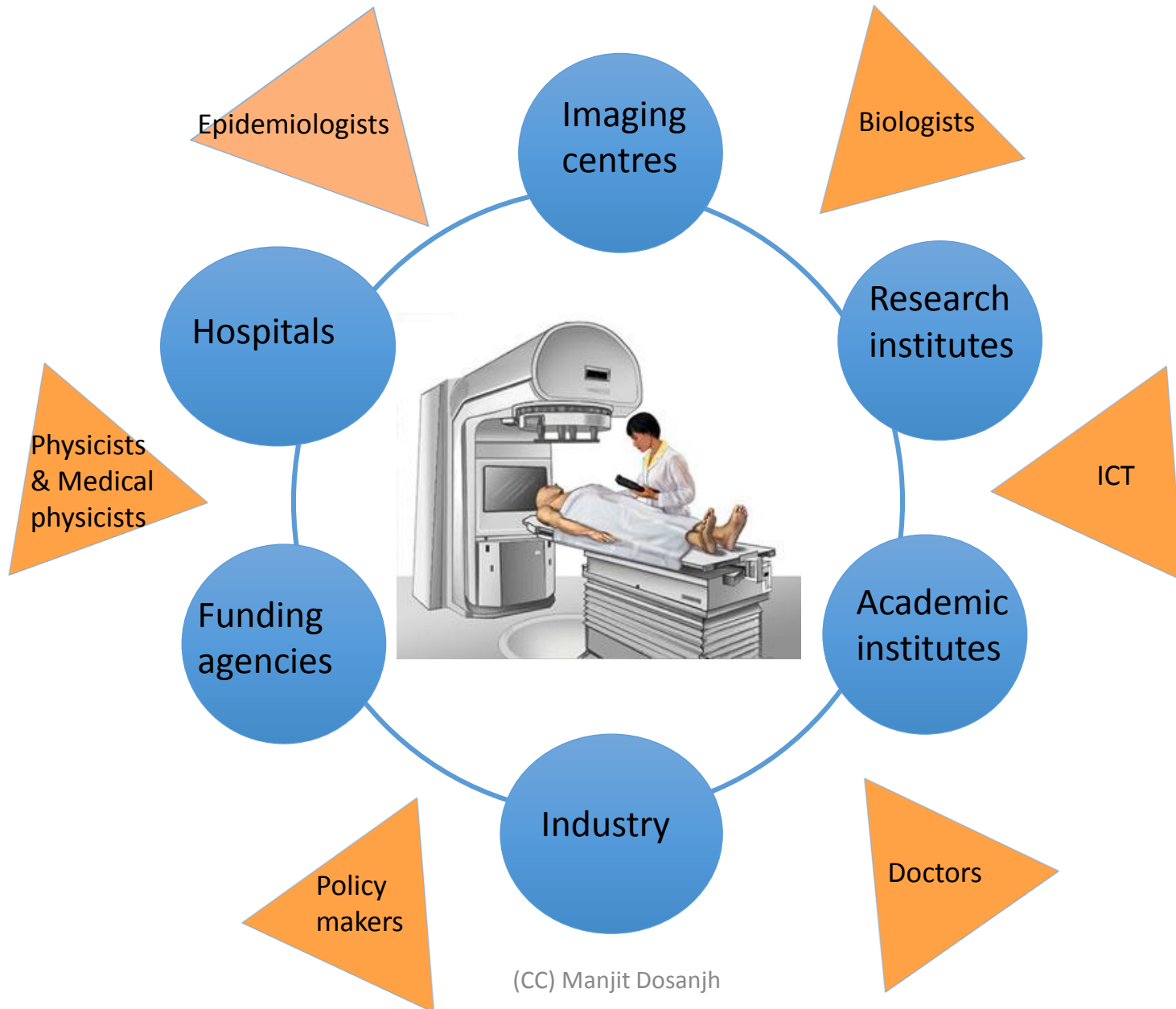
2012



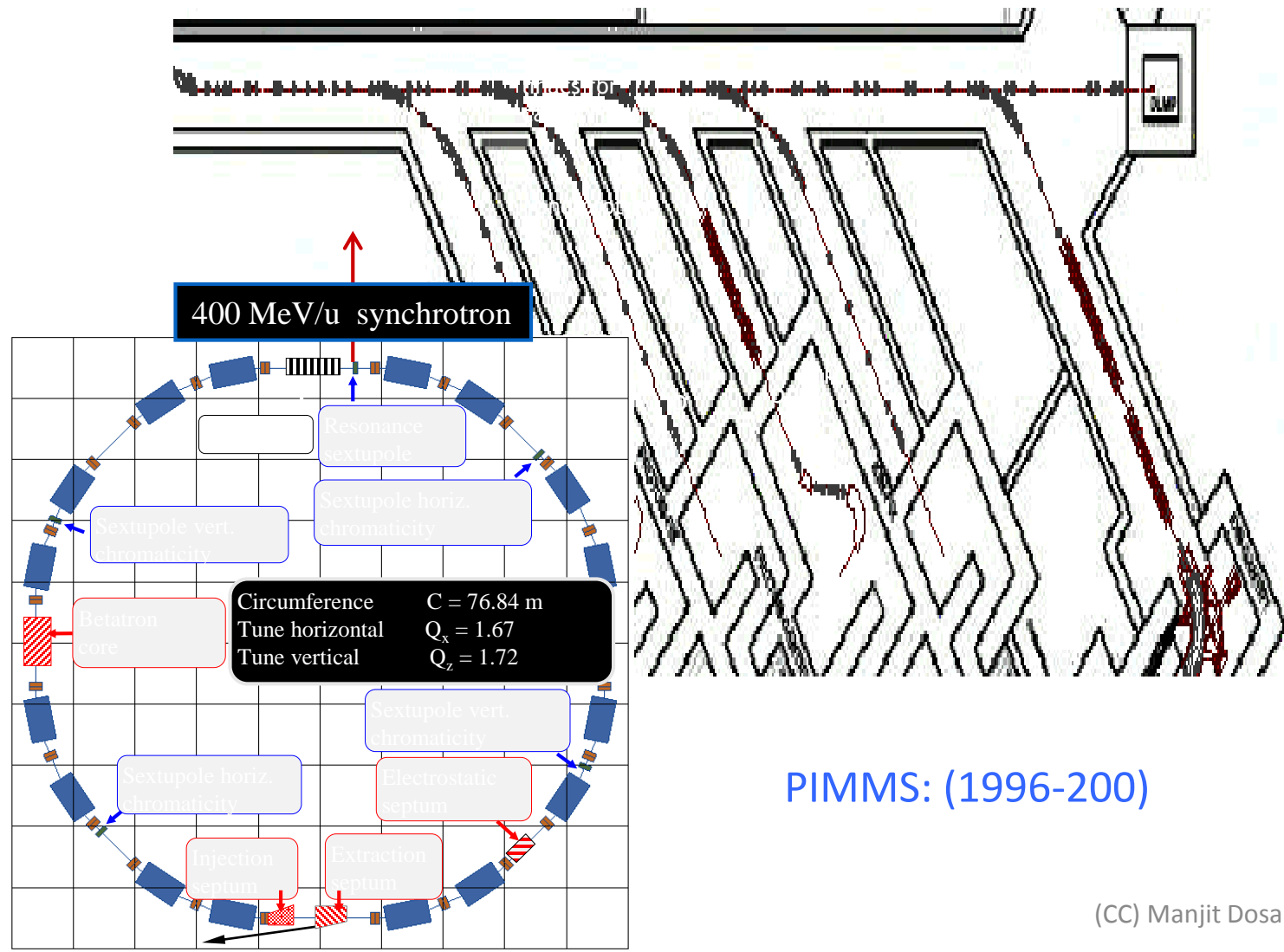
Source: DIRAC (Directory of Radiotherapy Centres), 2012 / IAEA

For more information: <http://www-naweb.iaea.org/nahu/dirac/>
dirac@iaea.org

ENLIGHT is a open collaborative network



PIMMS Study - trigger for ENLIGHT



PIMMS: (1996-200)

The beginnings of ENLIGHT

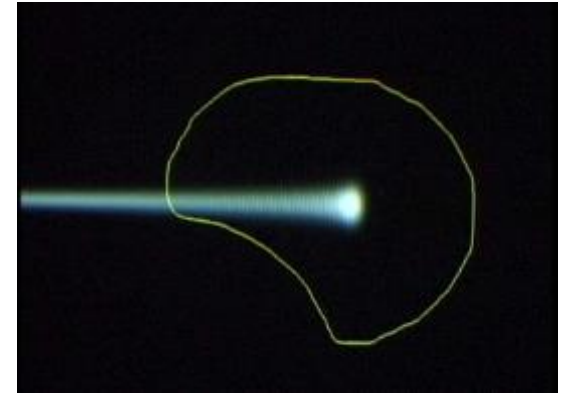
- Idea germinated in 2001 in Austria where PIMMS was presented
- ENLIGHT was launched in February 2002 at CERN



Organisers: Manjit Dosanjh & Hans Hoffmann

ENLIGHT was established to

- Create common multidisciplinary platform
- Cancer treatment
- Identify challenges
- Share knowledge
- Share best practices
- Harmonise data
- Provide training, education
- Innovate to improve
- Lobbying for funding



Leveraging Physics collaboration philosophy into a multidisciplinary medical environment



Facilities in operation then – Europe (2002)

- P centres
- C-ion centres
- ▲ Dual-ion centres



Source: PTCOG



- Marie Curie Initial Training Network
- 12 institutions
- 29 trainees

2008-2012



- Infrastructures for hadron therapy
- 20 institutions

2009-2013



- R&D on medical imaging for hadron therapy
- 16 institutions

2010-2014

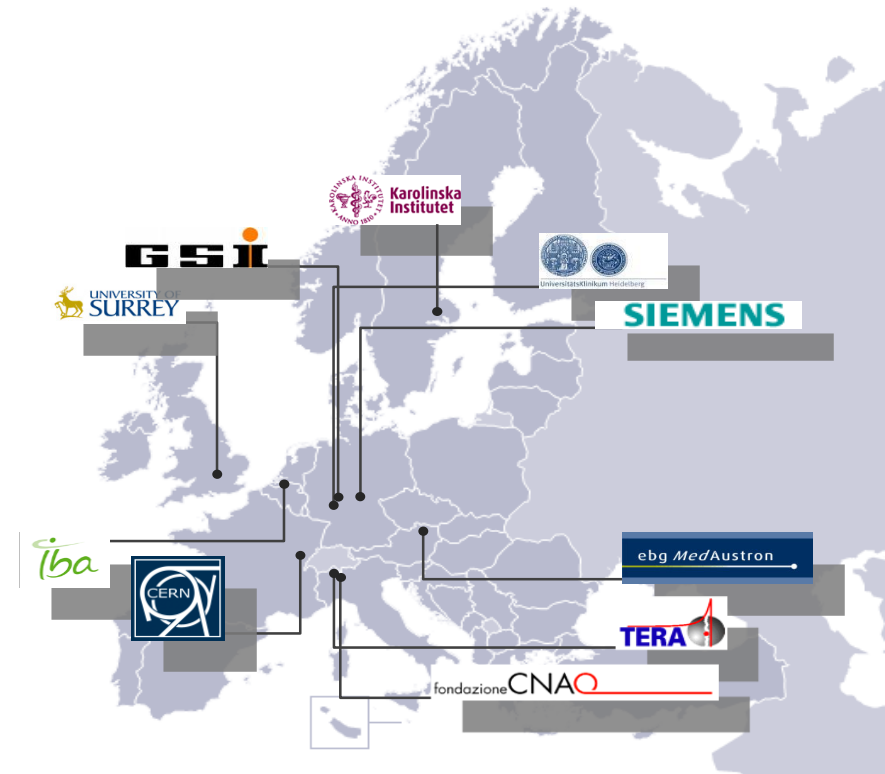


- Marie Curie ITN
- 12 institutions
- 16 trainees

2011-2015

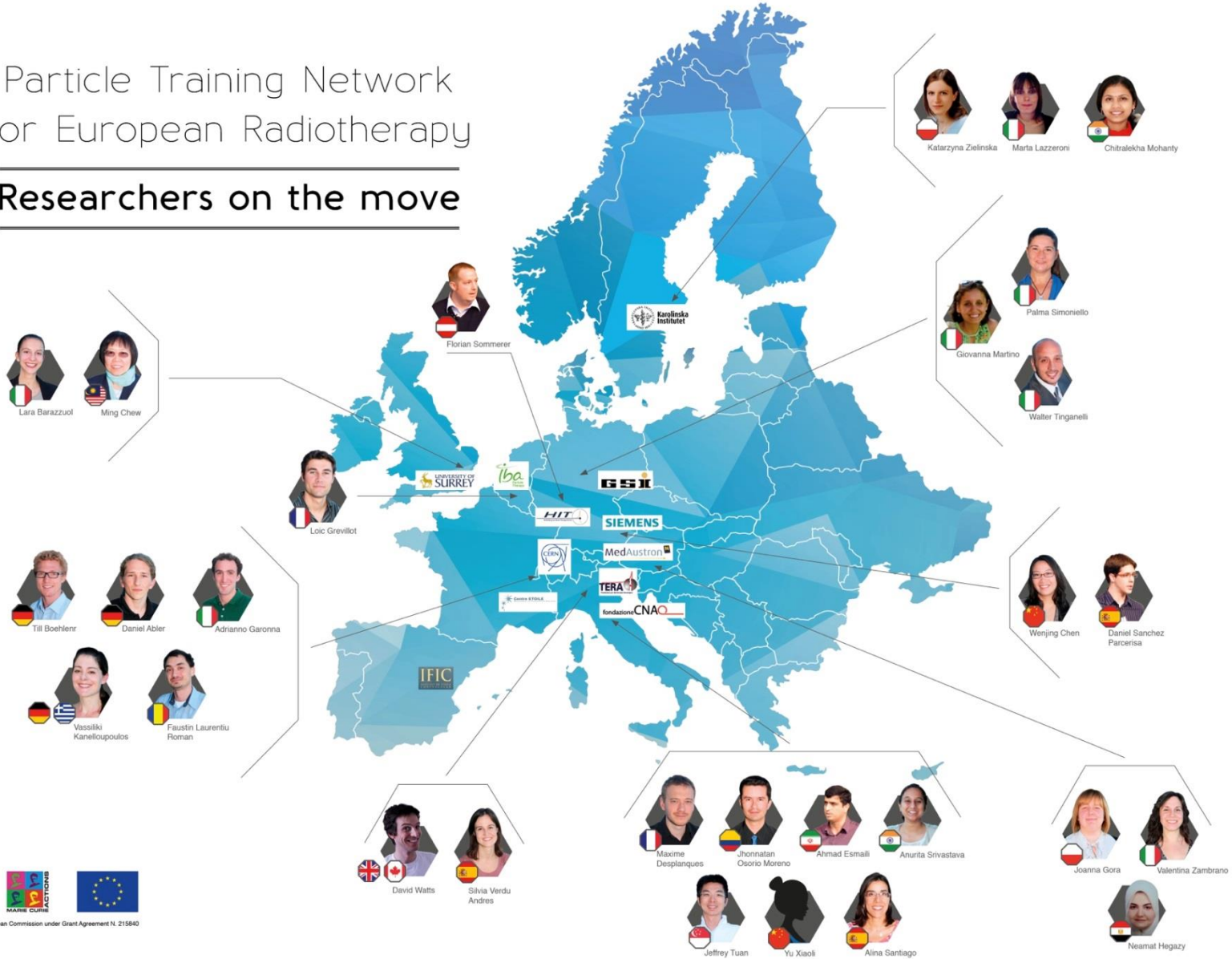
PARTNER – training of young people

- Particle Training Network for European Hadrontherapy
- 10 academic institutes, research centres, 2 leading companies
- 29 young researchers



Particle Training Network for European Radiotherapy

Researchers on the move



Particle Training Network for European Radiotherapy

Now working in...

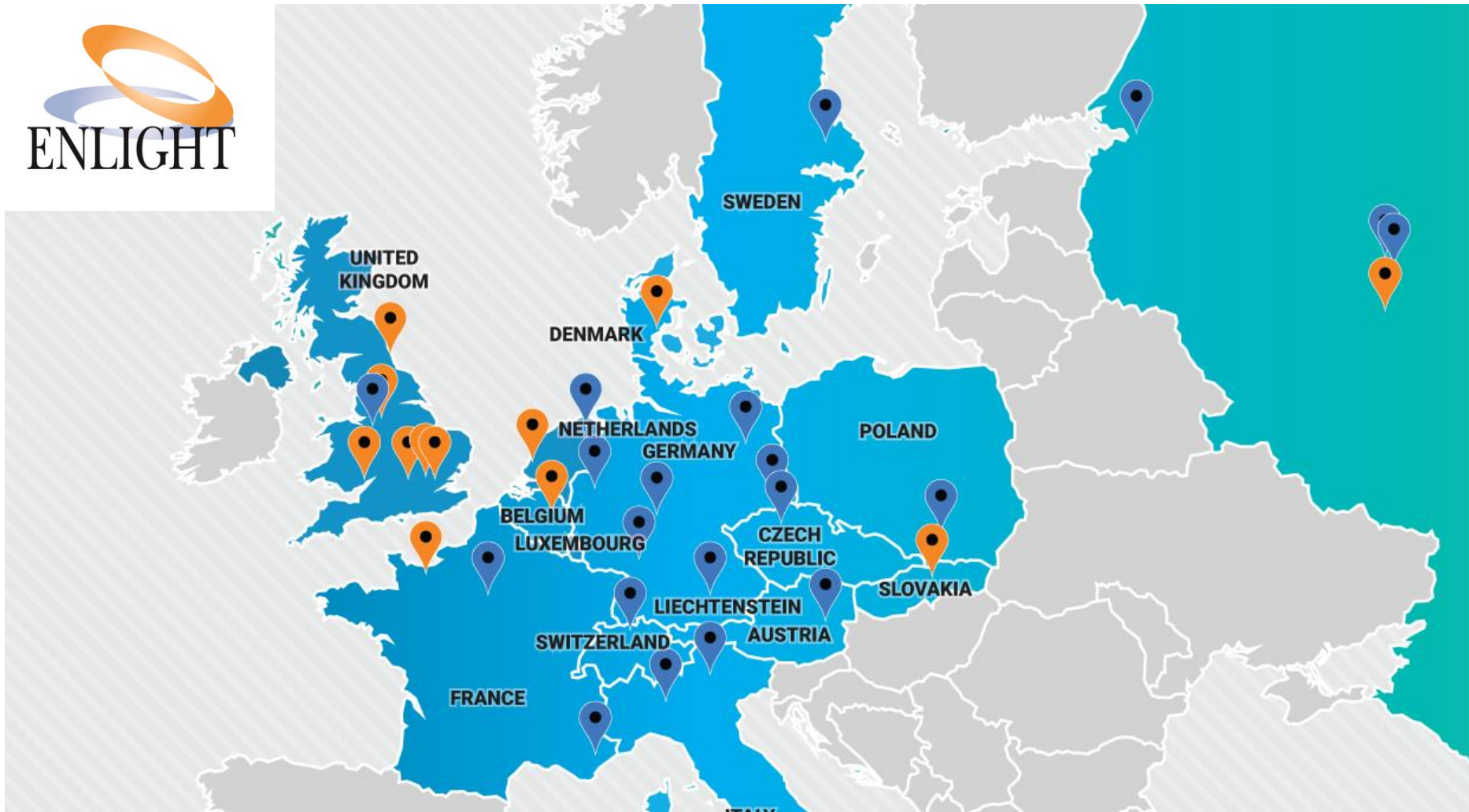


ENLIGHT 2015: was time for reflection

Much had changed since 2002: many centres, community was established, more than 600 members for over 20 countries, much had been done...

- Did we still need **ENLIGHT**?
- If yes, what sort of **ENLIGHT** did we need?

Facilities in operation now – Europe



2015 a turning point...new challenges

- Establish the ENLIGHT network as a **non-profit network/foundation** to make it sustainable since it is considered an important instrument and needs to be maintained
- Establish an Scientific Advisory Committee
- Play a key role in the education of the **young generation** in this rapidly growing field of particle therapy
- Help to fully exploit the **advantage of hadron therapy**: more research, better tools, clinical trials, extend collaboration
- Advise **partners** who want to have access to HT



CERN & Society

www.cern.ch/giving

ENLIGHT Training

Training young people and preparing skilled experts in radiation therapy

Why?

Society's need for qualified, competent experts in hadron therapy - Cancer patients' need to readily access this treatment - Practitioners' need for high-level training in hadron therapy

Who?

Research students on particle physics globally - Cancer patients worldwide

How?

1-week Introductory Training at CERN, 2-day Advanced Training at ENLIGHT Annual Meeting, 3-4 weeks hands-on Internship

Impact

30 students attending the Introductory Training

80 participants taking part to the Advanced Training

3 researchers completing a hands-on Internship



- **Annual meeting**, open, free
- Latest developments in the field
- Oral presentation for winning posters
- Networking
- Collaboration
- Exchanges
- Education and training at CERN
- Sharing and building bridges
- Raising awareness at international level
- Special day dedicated to training
- Biannual Magazine – **Highlights**
- **@ENLIGHTNETWORK**



16th  ENLIGHT meeting, 3 days –150 participants



UCL, London, UK

Dosimetry



Combined treatments: radiation and immunotherapy



Treatment with different light ions



Imaging



Patient Selection



Retreatment/ Re-irradiation



Paediatrics

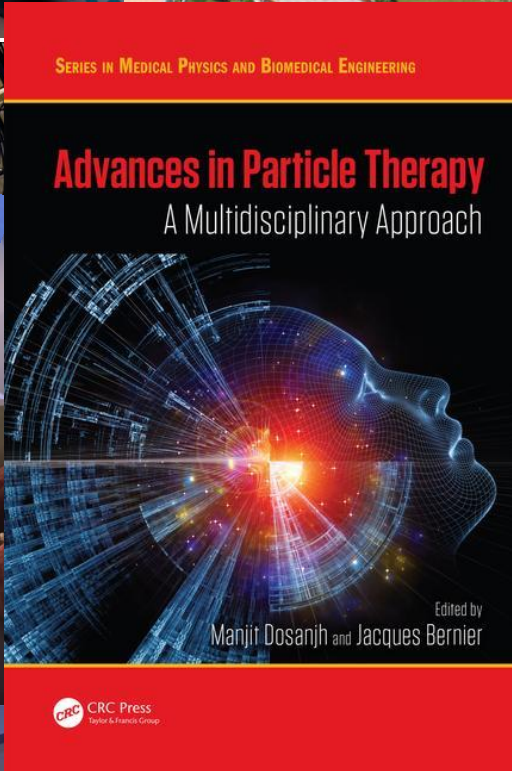
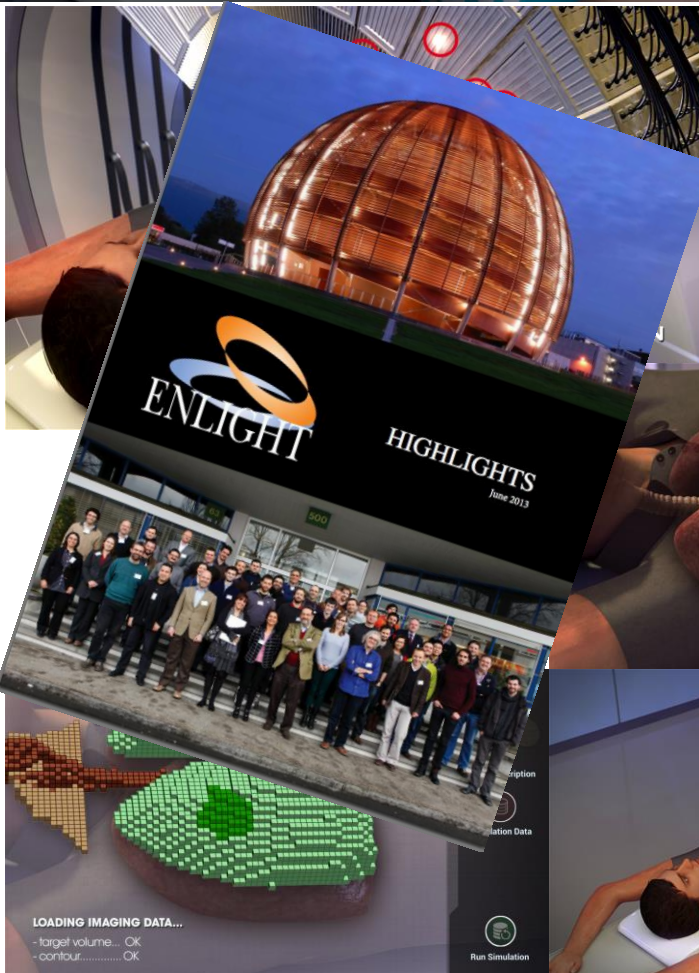


Personalised Treatment

ENLIGHT Training Day at UCL, 2018



80 participants (Master's students, PhD students)



LOADING IMAGING DATA...

-target volume... OK
-contour.....OK



Run Simulation

SINGLE PHOTON EMISSION COMPUTED TOMOGRAPHY

ENLIGHT- Interactive Material

- Imaging and hadron therapy animation
<http://cds.cern.ch/record/1611721?ln=en>
<http://cds.cern.ch/record/2002120>
- Interactive virtual visit to a hadrotherapy centre:
<http://www.cern.nymus3d.nl/maps#>
- PARTNER Marie Curie
<http://cds.cern.ch/record/1384426?ln=en>
<http://cds.cern.ch/record/1327668>
- ENERVISION Marie Curie
<http://cds.cern.ch/record/1541891>
- ULICE beam time
<http://cds.cern.ch/record/1475404>



**European NoVel Imaging Systems
for ION therapy**

<http://cds.cern.ch/record/1611721>

