

SYMPOSIUM

30TH ANNIVERSARY OF THE TERA FOUNDATION

15 SEPTEMBER 1992 - 15 SEPTEMBER 2022

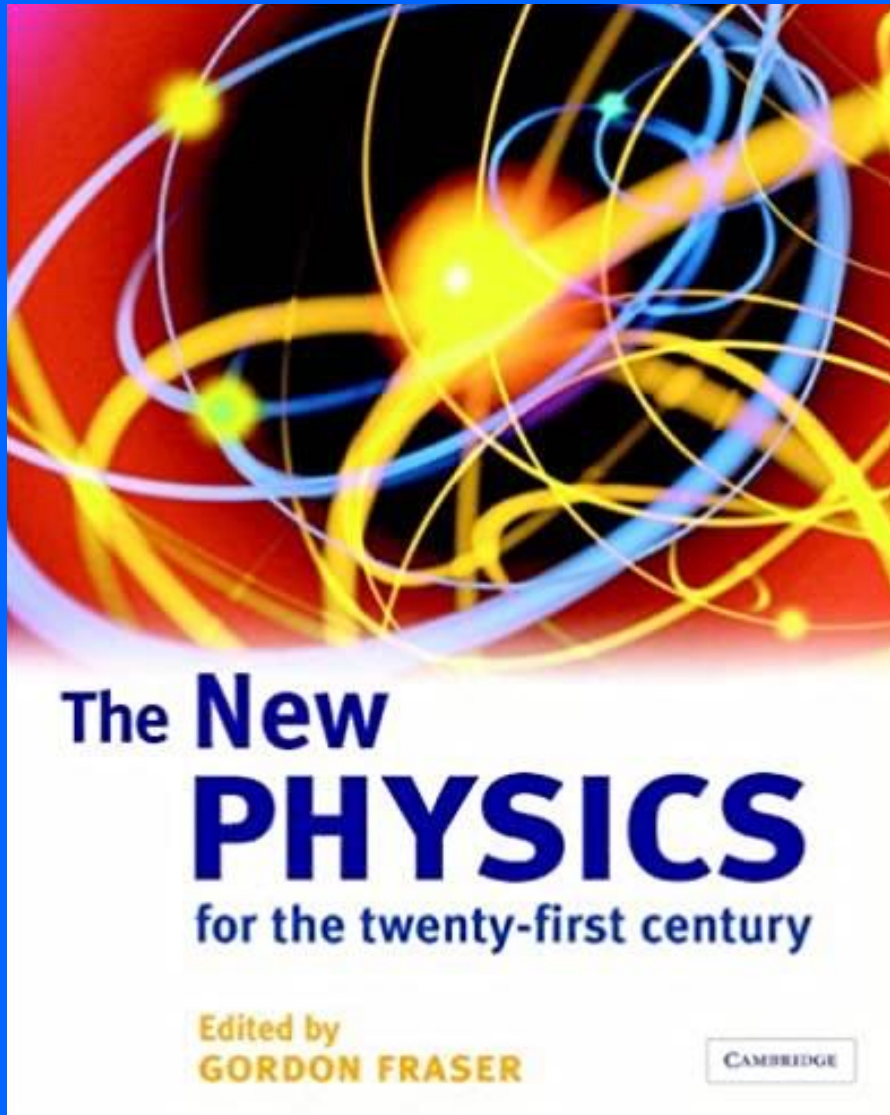
Symposium held as a hybrid event.
Registration is mandatory at the link below.



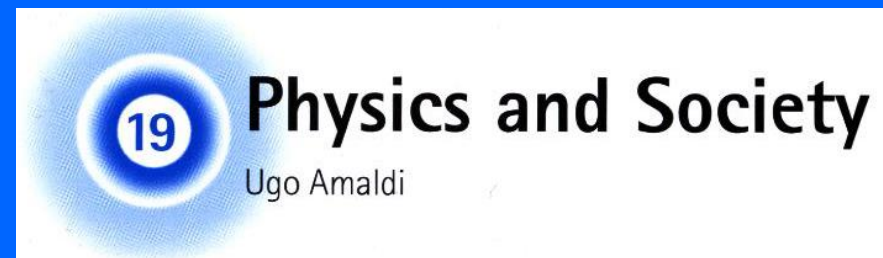
15 SEPTEMBER 2022
CERN - COUNCIL CHAMBER

CONCLUDING REMARKS

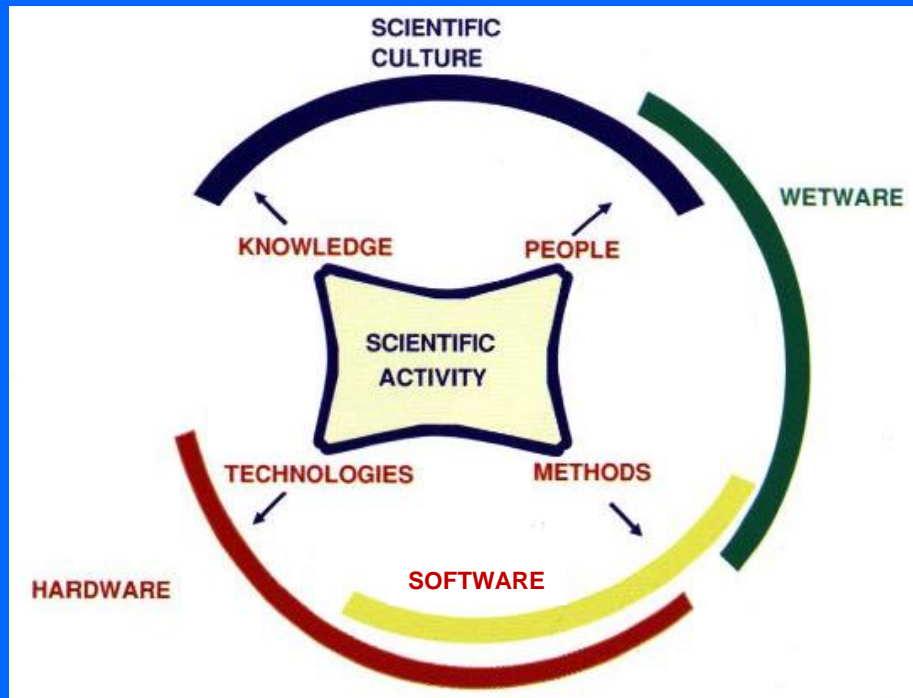
Ugo Amaldi



Gordon Fraser



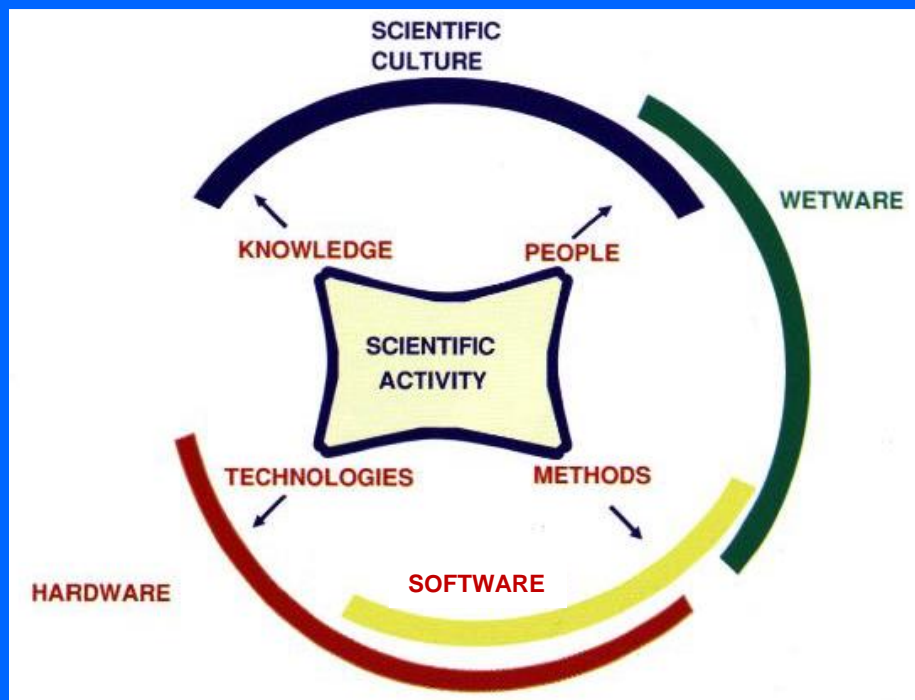
Physics, as all scientific activities, produces 4 streams



Fountain of the four rivers
Gian Lorenzo Bernini (1650)
Piazza Navona - Rome



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The 4 streams contribute to the world patrimony of **scientific culture**, **wetware** (brain capacity of producing new ideas), **software** and **hardware**

Examples of the four streams from CERN and TERA

KNOWLEDGE: **The existence of the Higgs field.**

PEOPLE: **The speakers of this Symposium**

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KNOWLEDGE: The existence of the Higgs field.

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METHODS: MC simulations of the interaction of radiations with matter

TECHNOLOGIES: Particle accelerators for fundamental research and therapy

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METHODS: MC simulation of the interaction of radiations with matter

TECHNOLOGIES: Particle accelerators for fundamental research and therapy

PHYSICS IS BEAUTIFUL AND USEFUL

TERA has followed four guidelines...

in the choice of the programmes:

CONSERVATION

INNOVATION

in the approach to realize them:

COLLABORATION

DOCUMENTATION

TERA has followed four guidelines...

in the choice of the programmes:

CONSERVATION Room temperature synchrotron

INNOVATION High-frequency linacs

in the approach to realize them:

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in the choice of the programmes:

CERN 1952

CONSERVATION

Room temperature synchrotron

600 MeV cyclotron

INNOVATION

High-frequency linacs

Strong focusing PS

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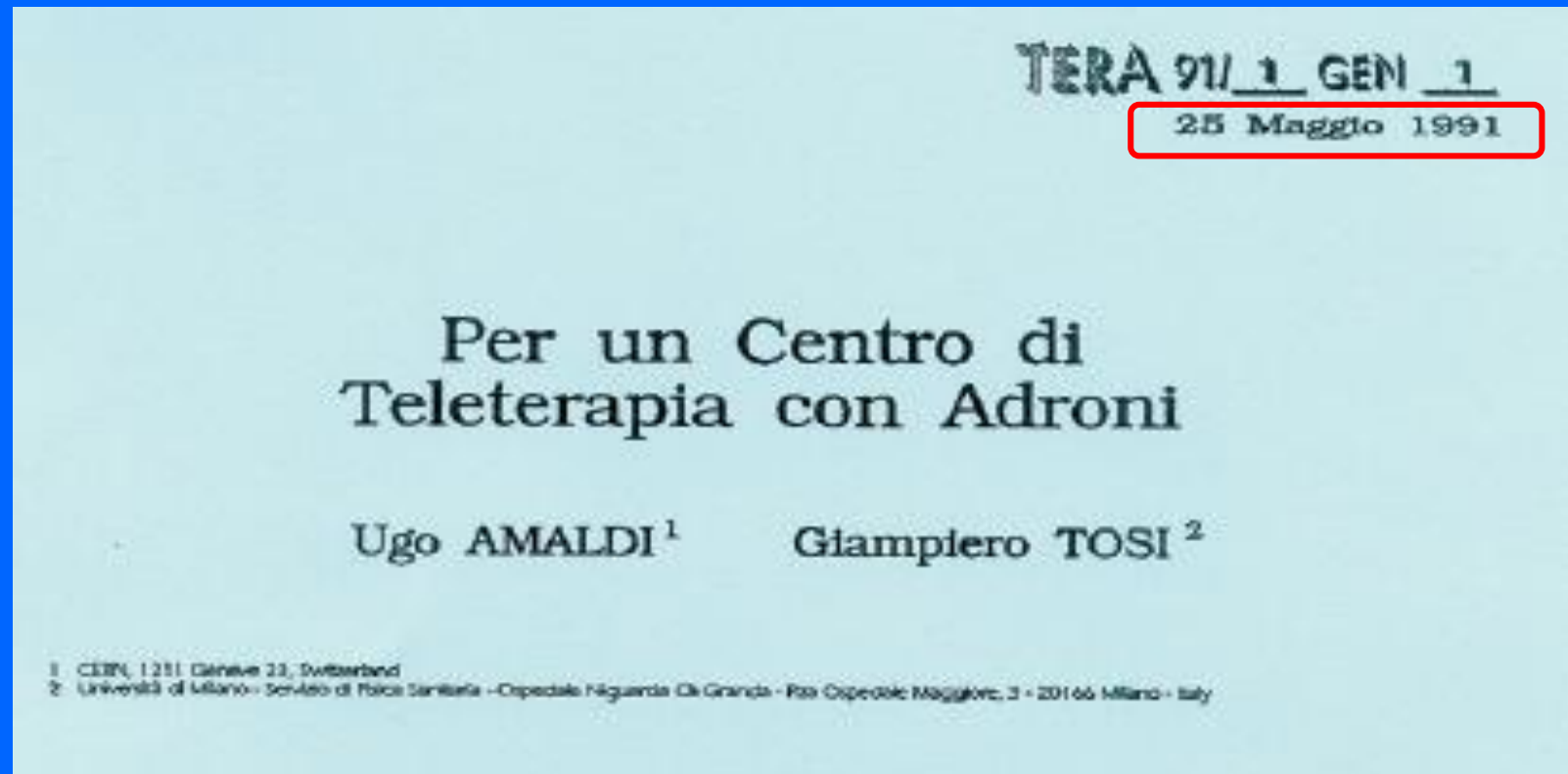
COLLABORATION

starting with the 91-92 trips of M. Silari and G. Petrucci

DOCUMENTATION

May 1991

UA and G. Tosi - Per un centro di teleterapia con adroni





President of INFN
Nicola Cabibbo
1935-2010

- May 1991 UA and G. Tosi - **Per un centro di teleterapia con adroni**
- August 1991 At the Geneva EPS Conference UA discusses with **N. Cabibbo**
- Sept. 1991 The new **INFN group ATER** (Milan) receives a first grant to travel



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BUT

- Spring 1992 **N. Cabibbo says that INFN will not attribute fellowships to ATER**



Gaudenzio Vanolo proposes to create in Novara a Foundation, called TERA, to collect money and give fellowships to physicists and engineers



Börje Larsson
1931–1998

January 1992

UA visits Börje Larsson in Villigen initiating a long standing collaboration with PSI



Börje Larsson
1931–1998

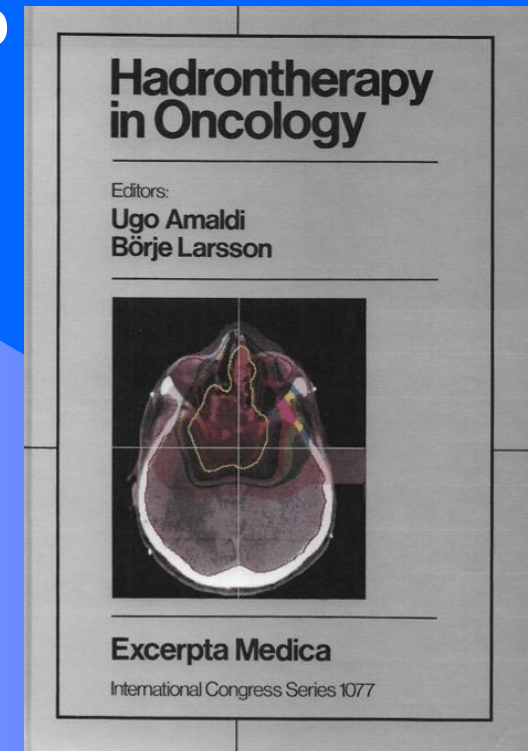
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From fall 1992 Organization of an International conference on hadron therapy with Proceedings - NEW IN THIS FIELD

Proceedings of the First International Symposium on Hadrontherapy, Como, Italy, 18–21 October 1993

All the actors were present from USA, Japan and Europe

Elsevier-1994



WITH CERN – as illustrated in this Symposium by many speakers

WITH INFN – Through the ATER Collaboration coordinated by Giancarlo Gialanella (INFN – Naples) formed by 12 groups



G. Gialanella
ATER
Coordinator



Roberto Cirio
Leader of
the Torino group

COLLABORATION-3

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ATER
Coordinator



Roberto Cirio
Leader of
the Torino group

WITH GSI – From 1993 with Gerhard Kraft and later with Marco Durante

Written many review papers together

Radiotherapy with beams of carbon ions

U. Amaldi and G. Kraft

Reports on Progress in Physics – 2005

430 citations



1993-1999

PROGRAMMA ADROTERAPIA

INFN - ISTITUTO NAZIONALE DI FISICA NUCLEARE
AIFB - ASSOCIAZIONE ITALIANA DI FISICA BIOMEDICA
AIFS - ASSOCIAZIONE ITALIANA FISICA SANITARIA
AIRB - ASSOCIAZIONE ITALIANA DI RADIOBIOLOGIA
AIRO - ASSOCIAZIONE ITALIANA DI RADIOTERAPIA ONCOLOGICA
CERN - EUROPEAN LABORATORY FOR PARTICLE PHYSICS
ENEA - ENTE PER LE NUOVE TECNOLOGIE, L'ENERGIA E L'AMBIENTE
ISS - ISTITUTO SUPERIORE DI SANITÀ
SIRR - SOCIETA ITALIANA PER LE RICERCHE SULLE RADIAZIONI
TERA - FONDAZIONE PER ADROTERAPIA ONCOLOGICA

1995-2000

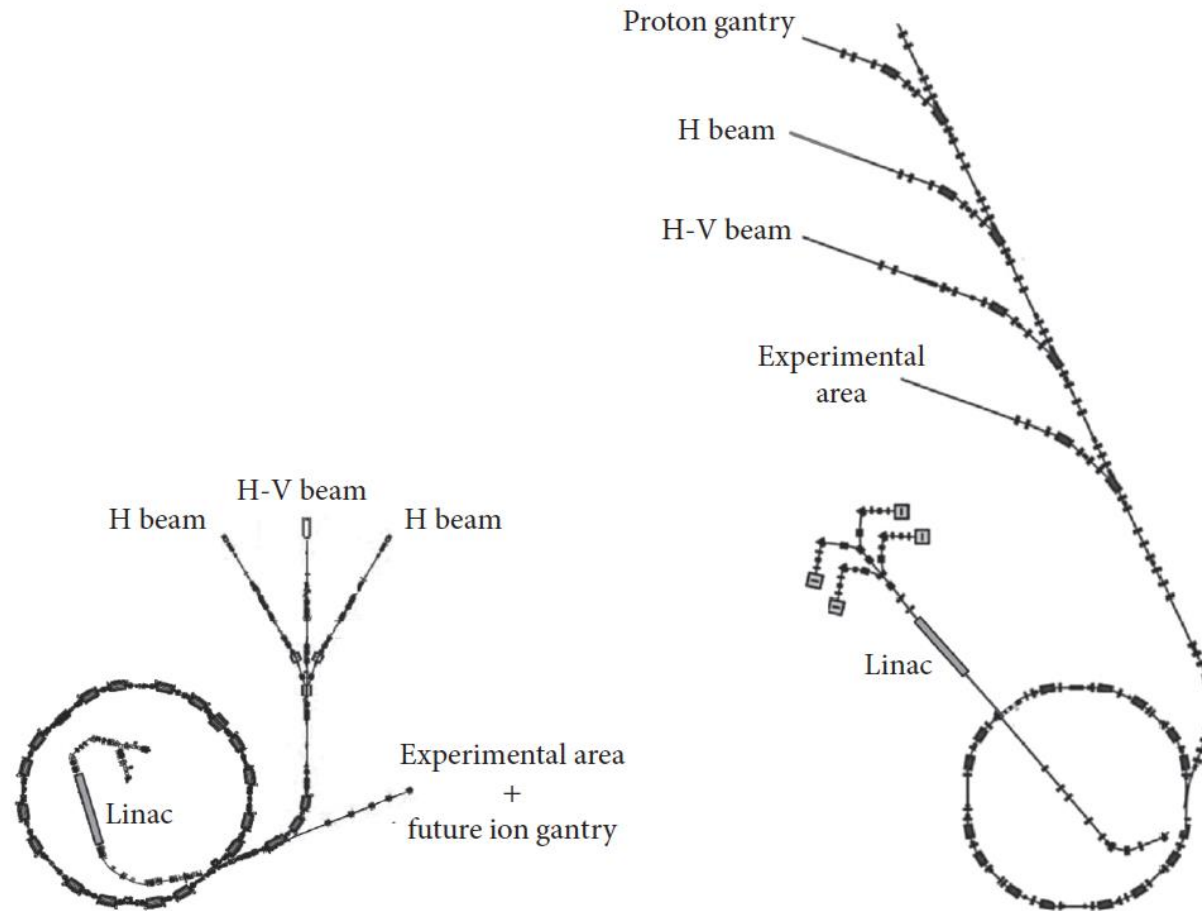
Proposed with Meinhard Regler (MedAustron)

PIMMS

and Phil Bryant (CERN) to CERN Management



PIMMS was conceived as a tool kit from which each user could choose the components fitting his needs



CNAO – p in 2011

MedAustron – p in 2016



COLLABORATION-5: ENLIGHT

GREEN JOURNAL 2018

The purpose of a Hadron Therapy collaboration was defined in an ESTRO meeting chaired by **Richard Pötter** in **December 2000**

In a second meeting called by **Jean-Pierre Gérard**, at the time ESTRO President – to **submit a proposal** to the European Framework Programme FP5.



Manjit Dosanjh



COLLABORATION-5: ENLIGHT

GREEN JOURNAL 2018

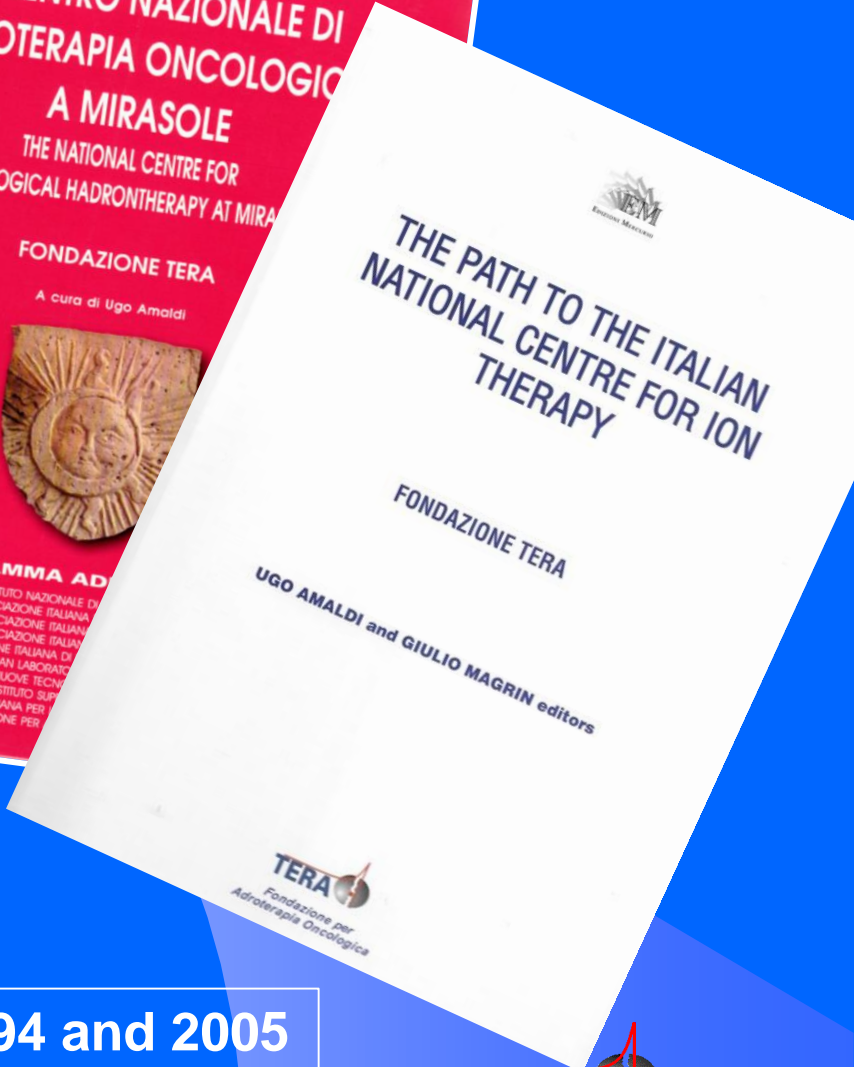
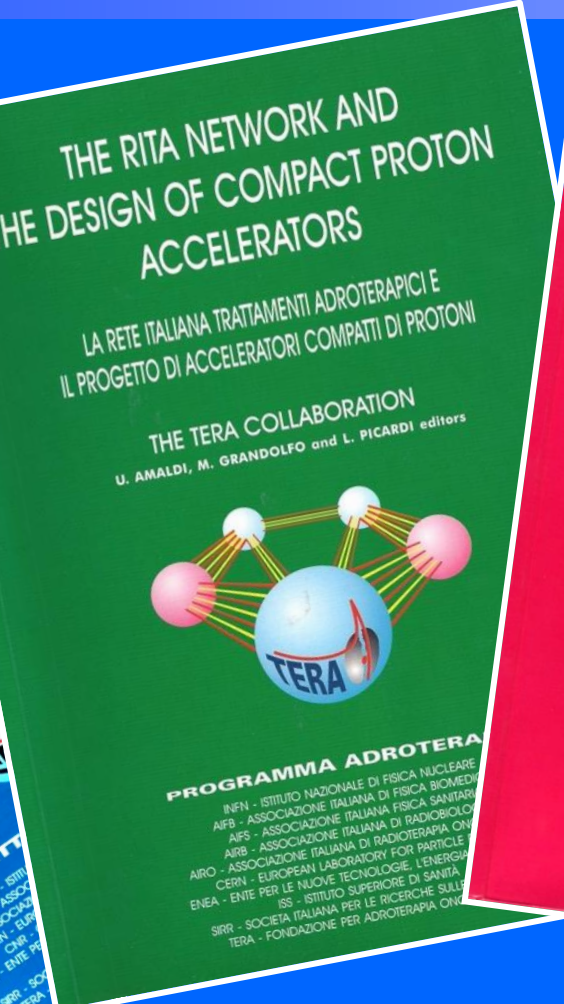
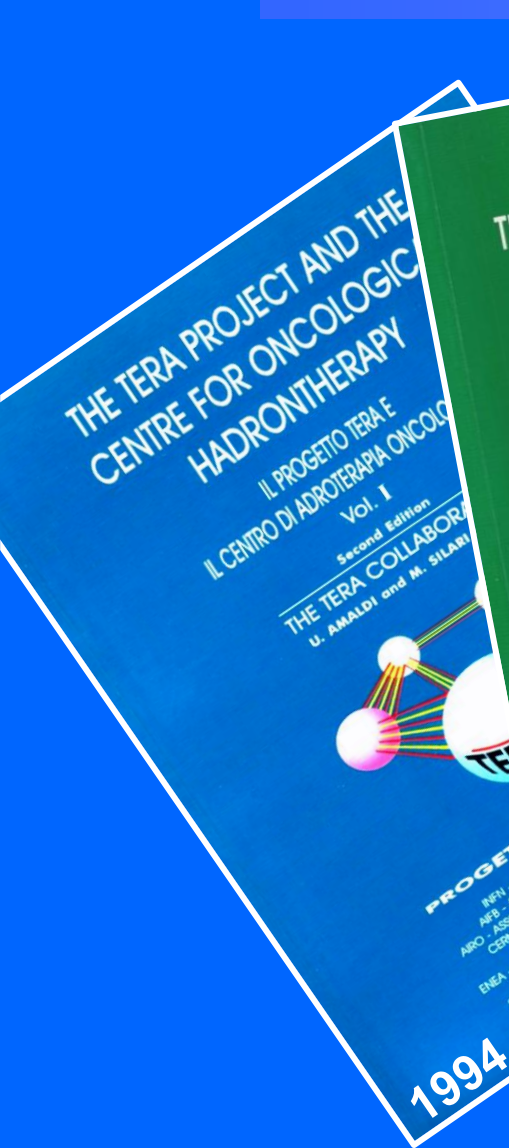
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Ugo Amaldi, Jean-Pierre Gérard, Gerard Kraft and Hans Svensson were given the responsibility for putting together the proposal of a new Network; the work was coordinated by **Germaine Heeren**.

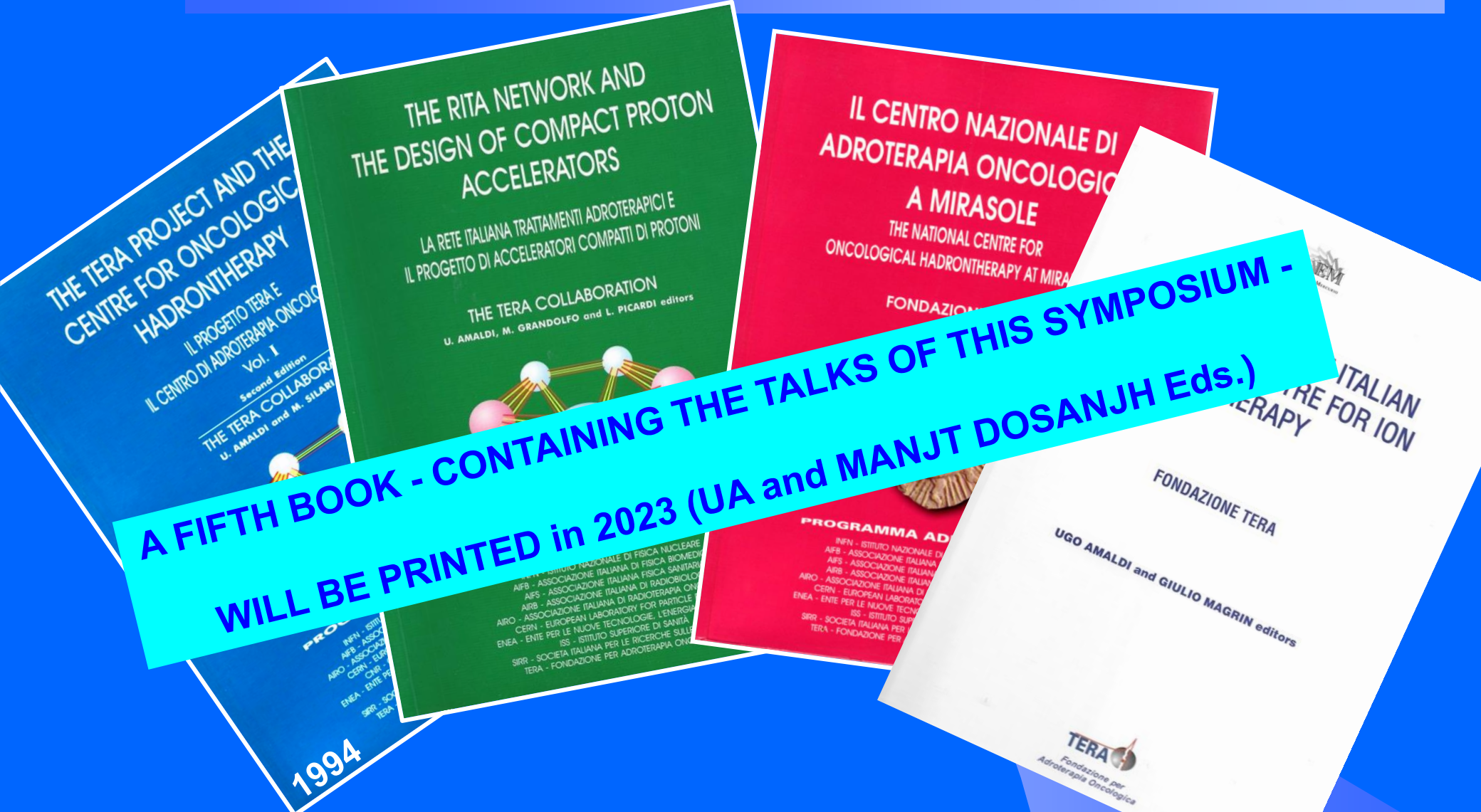


Manjit Dosanjh



4 books edited between 1994 and 2005





A FIFTH BOOK - CONTAINING THE TALKS OF THIS SYMPOSIUM - WILL BE PRINTED in 2023 (UA and MANJT DOSANJH Eds.)

4 books edited between 1994 and 2005

The new book will contain Appendices with the lists of

- **More than 100 scientific papers published in peer-reviewed journals**
- **More than 200 TERA Internal Notes**
- **More than 100 Master and PhD thesis**
- **More than 150 names of young physicists and engineers who have worked in TERA**
- **6 patents on linacs for hadron therapy, passed to AVO-ADAM**

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**Globally TERA has spent 30 million euro in 30 years
About 1.5 million were European Grants, all in collaboration with CERN
The rest was donated by Foundations, Companies,
private citizens, also in the framework of information campaigns**

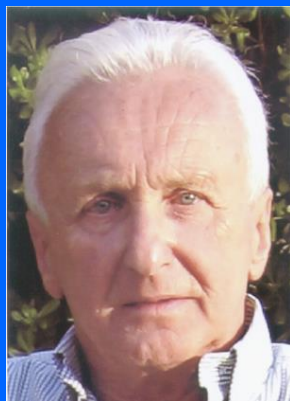
TERA BOARD TAKES THIS OCCASION TO THANK ALL THE SPONSORS

Support by CERN Senior people

Many retired people have contributed to TERA activities (INCOMPLETE LIST)



Pierluigi Riboni
PL of Mechanics Group



Mario Weiss
LIBO Project Leader

Giorgio Brianti
Jacques Bosser
Remo Maccaferri
Gianni Molinari
Peter Pearce
Giacomo Primadei
Pierluigi Riboni
Ettore Rosso
Balazs Szeless
Dirk Toet
Mario Weiss



Giorgio Brianti
Chair of the PIMMS
Machine Advisory
Committee

**Leader of the CERN group
In the LIBO Collaboration**

Two persons have helped me enormously

MARIA DI ROSA

GAUDENZIO VANOLO

MANY MANY THANKS TO THEM