International School of Physics
"Enrico Fermi"
of the Italian Physical Society - SIF
Villa Monastero - VARENNNA

Course CLXXXVI
"New Horizons for Observational Cosmology"

1-6 July 2013

Directors:
A. Cooray (Irvine, California, USA)
E. Komatsu (MPI-Astrophysik, Garching, D)
A. Melchiorri (Roma La Sapienza, I)
Topics

- Cosmic microwave backgrounds and anisotropies
- Galaxy Clustering
- Weak lensing
- Dark Energy
- Dark Matter
- Inflation
- Modified gravity
- Neutrino physics
- Reionization
- Galaxy formation
- First stars

Speakers

- D. Baumann (Cambridge, UK)
- R. Beran (Ithaca, NY, USA)
- S. Dodelson (Batavia, IL, USA)
- A. Ferrara (SNS, Pisa, I)
- H. Hoekstra (Leiden, NL)
- W. Percivall (Portsmouth, UK)
- J. Silk (Paris, F)
- B. Wandelt (Paris, F)
A number of advanced Courses have been held in topical fields in the past 60 years. Considerable attention is paid to the cultural impact and up-to-date scientific content of the themes discussed, as well to a fair distribution among the different fields of contemporary physics.

All Courses have been directed and attended by famous and outstanding physicists, from all over the world, including 60 Nobel laureates.

The proceedings of all Courses have been published by SIF, since the foundation of the School. Besides the pedagogical value, they have also a relevant interest as an historical archive.
Nobel Prize Winners in Varenna

Along the years several Nobel Prize Winners participated in the International School of Physics "Enrico Fermi" in Varenna as lecturers or directors.

Here is the list:

Name (prize awarded in year) in Varenna

Sheldon Lee Glashow (1979) 1964
Abdus Salam (1979) 1971
Arno Allan Penzias (1978) 2004
Sir Nevill F. Mott (1977) 1957
John H. van Vleck (1977) 1956
Aage Niels Bohr (1975) 1976 (director) - 1955
Leo Esaki (1973) 1991
Leon Neil Cooper (1972) 1955
Dennis Gabor (1971) 1958
Louis E. F. Néel (1970) 1956
Luis Walter Alvarez (1968) 1964 (director)
Hans Albrecht Bethe (1967) 1984
Alfred Kastler (1966) 1956 - 1960
Eugene Paul Wigner (1963) 1963 (director)
Donald Arthur Glaser (1960) 1953
Tsung-Dao (T.D.) Lee (1957) 1964 (director)
John Bardeen (1956) 1983
Willis Eugene Lamb (1955) 1963
Edwards Mills Purcell (1952) 1956
Cecil Frank Powell (1950) 1953
Patrick M. S. Blackett (1948) 1953
Wolfgang Pauli (1945) 1958
Isidor Isaac Rabi (1944) 1955
Enrico Fermi (1938) 1954
Paul A. M. Dirac (1933) 1972
Werner K. Heisenberg (1932) 1954
L. V. P. R. de Broglie (1929) 1970

Georges Charpak (1992) 1984
Wolfgang Paul (1989) 1965
Melvin Schwartz (1988) 1964
Klaus von Klitzing (1985) 2012
S. Chandrasekhar (1983) 1975
William A. Fowler (1983) 1965
1953 – 2013

190 courses
> 12000 participants
60 Nobel Prize winners
PASSION FOR PHYSICS
International School of Physics Enrico Fermi
60th Anniversary
15 June 2013
Villa Monastero
Varenna (Lake Como)

UNDER THE HIGH PATRONAGE OF THE PRESIDENT OF THE ITALIAN REPUBLIC

WELCOME!
Luisa Cifarelli, SIF President
Luigi Nicolais, CNR President
Ezio Puppin, CNISM President
on behalf the Rector of Politecnico di Milano Giovanni Azzone
Gianluca Bezzi, Councillor for the Territory & Economic Development
on behalf of the President of the Province of Lecco Daniele Nava
Carlo Molteni, Mayor of Varenna
Vico Valassi, President of the Chamber of Commerce of Lecco
PROGRAMME
Aula Fermi

9.40 – Chair: Renato Angelo Ricci - SIF
Francesco Iachello – Supersymmetry in Nuclei

11.00 – Coffee break

11.30 – Chair: Massimo Inguscio - CNR
Alain Aspect – Fascination for the Weirdness of Quantum Mechanics: from Fundamental Questions to Applications
Carlo Rubbia – The Marvellous Neutrino

13.00 – Lunch break, interviews, etc.
PROGRAMME
Aula Fermi

14.30 – Chair: Alessandro Bettini - SIF
Jack Steinberger – Personal Recollections of Varenna: Physics, Fermi, Mountains
Harut Avakian – 3D Structure of the Nucleon
Uzy Smilansky – Quantum Networks

16.00 – Coffee break

16.30 – Chair: Ezio Puppin - Politecnico di Milano
Diederik Wiersma – Disordered Photonics
Michael Ghil – The Complex Physics of Climate Change and Climate Sensitivity: a Grand Unification
Fernando Ferroni – Higgs Found. What Next?

18.30 – Closing Remarks

19.30 – Concert, buffet dinner and light show at Villa Monastero
A BIT OF HISTORY

Under SIF President Giovanni Polvani
International School of Physics of Varenna

1953 — 1st Course
The contribution from cosmic rays to elementary particles physics
Director: Giampietro Puppi
Lecturers: Patrick M.S. Blackett and Cecil Powell

1954 — 2nd Course
The contribution from existing and planned accelerators to elementary particles physics
Director: Giampietro Puppi
1953

“With the hope that this ‘dress rehearsal’, being as is in the hands of so outstanding scientists and followed by students with so impatient inquiring minds, might proceed worthily and fruitfully grow, I have the honour to declare open the 1953 summer course of the International School of Physics of the Italian Physical Society.

And to this School, that adds up to the other initiatives of our association, I would dare assign as mission, the famous one, contained in the words of the ‘great Farnese’ (Cardinal Alessandro Farnese): Votis subscribent fata secundis (Destiny does make dreams come true).”

Giovanni Polvani – SIF President
With these words the then President of the Italian Physical Society Giovanni Polvani concluded his inaugural address to the 1st course of the Varenna School which was titled: "Issues related to elementary-particle detection, with special attention to cosmic radiation".

The course was directed by Giampietro Puppi and the lecturers were outstanding scientists like Cecil Powell, Patrick Blackett, Hannes Alfvén, Giuseppe (Beppo) Occhialini, to name but a few.
1954

The 1st course was a real success, to the extent that Puppi was asked to direct another one in the Summer of 1954.

The 2nd course was again devoted to elementary particles, this time placing emphasis on accelerators: “The contribution from existing and planned accelerators to elementary particles physics”.

In his opening address Puppi talked about “the fantastic world of high-energy phenomena”.

To illustrate them, eminent physicists were invited to lecture, like Enrico Fermi, Werner Heisenberg, Gilberto Bernardini, Bruno Rossi ...
1954

Enrico Fermi and Werner Heinsenberg gave the first two lectures of a series on the physics of pions and nucleons.

Gilberto Bernardini, Bernard T. Feld and others took care of a second group of lectures on photoproduction.

Bruno Rossi lectured on fundamental particles and on the origin of cosmic rays.

Various particle accelerator facilities and projects in different laboratories in Europe were illustrated by a number of world experts.
A celebrated group photo 1954
Fermi gave 16 lectures in Varenna on “PIONS and NUCLEONS” from 16th of July to 6th of August 1954

He passed away a few months later

Exactly one year later on the 6th of August 1955 an official commemorative ceremony was organised by President Polvani in Varenna and Como in the presence of Fermi’s wife, Laura Fermi Capon, and Fermi’s sister, Maria Sacchetti Fermi

President Polvani announced that the School would be named after Enrico Fermi
“... a series of astral conjunctions has created around the second course a particular charisma, besides the fact that clearly during the course a sort of theological summa of what was known about pion physics has been made which has served as reference for a long time.

But then Enrico Fermi’s death has reflected on this second year a particular light and when anyone talks about Varenna School, the second year and Enrico Fermi cross our minds.”

Giampietro Puppi – Director of the School
In 1955 in Como at the Tempio Voltiano, Isidor I. Rabi was invited to give the official commemorative address in honour of Enrico Fermi

“Here in Italy where his memory is so alive and where so many have heard Fermi lecture I do not have to describe the remarkable fascination he could induce in any audience. He used no histrionics in his delivery. It was always calm and deliberate. The fascination lay in the feeling of clarity and simplicity he could impart to the audience. They felt illuminated and had the sense of participating in profound and beautiful insight”

This is what Fermi’s lectures still inspire
Also a porphyry plaque was placed bearing a Latin epigraph:

**ENRICO FERMI**
— 1954 - 53rd of his life —

”Here with quiet spirit among so many natural beauties, I revealed for the last time, to a rank of men of science, the ultimate and most remote elements in motion inside the atoms, with which I had already made my name immortal”
On the 70th anniversary of the Nobel Prize award to Enrico Fermi in 1938, the Italian Physical Society has reprinted in a special issue of La Rivista del Nuovo Cimento the original “Lectures on Pion and Nucleons” by Enrico Fermi.
Varenna is one of the most beautiful and characteristic villages in the eastern bank of Lake Como. The mild climate and the picturesque surroundings guarantee a relaxing and peaceful stay.

Villa Monastero, once a monastery – hence its name – is one of the most ancient and beautiful villas of the region with its impressive botanic garden.
“That branch of the Lake Como, which extends toward the south between two unbroken chains of mountains, all bays and inlets, as they protrude and recede, comes, almost abruptly, to contract itself and take the course and form of a river, between a promontory on the right and a wide shorefront on the opposite side; and the bridge, which there joins the two banks, seems to render this transformation even more sensitive to the eye, and mark the point where the lake is no more and the Adda begins anew, soon to resume the denomination of lake where the banks, receding once more, allow the water to extend and slacken its flow in new gulfs and bays. ... “
I am sure that this Course will be a success and hope it will pave the way for further developments in this very promising and fascinating field.

Have a pleasant and fruitful stay in Varenna
“For the time being let us content ourselves with elementary particles and more properly let us follow them in high-energy phenomena, in that fantastic world where everything happens in tiny volumes of space incredibly small and in time intervals extraordinarily short, involving however energies which, if macroscopically scaled, would appear as frightening”