International School of Physics “Enrico Fermi” of the Italian Physical Society - SIF

Course 187
"WATER: FUNDAMENTALS AS THE BASIS FOR UNDERSTANDING THE ENVIRONMENT AND PROMOTING TECHNOLOGY"

8 - 13 July 2013

Directors:
P. G. Debenedetti - Princeton, NJ (USA)
M. A. Ricci - Roma Tre (Italy)
While being easily the most common substance on earth, water behaves in a most unusual way, doing quite different things to what one would expect in comparison to other substances in nature.

This unusual and surprising behavior is the very basis for life in our world. If water behaved the way scientists would expect it to, when compared to other similar substances, then many strange things would happen in nature around us.

Water presents several thermodynamic anomalies that constitute an intriguing puzzle that attracts scientists of different disciplines.
A VERY INTERESTING PROGRAM

TOPICS
• WATER IN RELATION TO OTHER LIQUIDS
• BIOLOGICAL WATER
• LOCAL ENVIRONMENT OF WATER PROTONS
• AB-INITIO SIMULATIONS OF WATER
• HYDROPHOBICITY
• ATMOSPHERIC WATER
• AMORPHOUS SOLID PHASES OF WATER
• NMR STUDIES OF WATER
• MINIMALIST MODELS OF WATER
• SPECTROSCOPIC STUDIES OF WATER
• NANOSCALE HYDRATION
• WATER AT INTERFACES
• THE STRUCTURE OF LIQUID WATER
• SUPERCOOLED WATER

LECTURERS
• C. AUSTEN ANGELL -Tempe, USA
• B. BERNE, Columbia, USA
• F. BRUNI, Roma Tre, Italy
• G. GALLI, Davis, USA
• S. GARDE, Rensselaer, USA
• T. KOOP, Bielefeld, Germany
• T. LOERTING, Innsbruck, Austria
• F. MALLAMACE , Messina, Italy
• V. MOLINERO, Salt Lake City, USA
• A. NILSSON, SLAC, USA
• P. ROSSKY, Austin, USA
• R. SAYKALLY, Berkeley, USA
• A. K. SOPER, Rutherford (UK)
• H. E. STANLEY, Boston , USA
From 1953, without interruptions, SIF has been organizing in Varenna the International School of Physics “Enrico Fermi”.

The school is dedicated to high-level international courses on all topical fields of physics or at the interface with other disciplines. 186 advanced Courses have been held up to now. All Courses have been directed and attended by famous and outstanding physicists, from all over the world, including 62 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.
1953 — 1st Course of the International School of Physics of Varenna

"THE CONTRIBUTION FROM COSMIC RAYS TO ELEMENTARY PARTICLES PHYSICS"

Under SIF President Giovanni Polvani

Director: Giampietro Puppi

Lecturers: outstanding scientists like Patrick M.S. Blackett, Cecil F. Powell, Donald A. Glaser, Hannes Alfven, Giuseppe (Beppo) Occhialini, to name but a few
"THE CONTRIBUTION FROM EXISTING AND PLANNED ACCELERATORS TO ELEMENTARY PARTICLES PHYSICS"

Director: Giampietro Puppi

From his Prolusion
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.
To illustrate this “fantastic world”

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, Jack Steinberger took care of a second group of lectures on photoproduction.

Bruno Rossi, Connie Dilworth Occhialini, and Edoardo Amaldi and others 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

J. Steinberger
B. Rossi
G. Polvani
G. Salvini
E. Fermi
G. Bernardini
G. Occhialini
G. Puppi
M. Conversi
L. Leprince-Ringuet
“... a series of astral conjunctions has created around the second course a particular charisma, besides the fact clearly during the course a sort of technological 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 reflected on this second year a particular light and when anyone talks about Varenna School, the second year and Enrico Fermi cross our minds.”

From the official commemorative address of Giampietro Puppi, Director of the 2nd Course at the Tempio Voltiano in Como, in 1955.
PERSONAL RECOLLECTIONS OF VARENNA: PHYSICS, FERMI, MOUNTAINS

Jack Steinberger, “Passion for Physics” June 15th 2013
THE NAMING OF THE SCHOOL

• Fermi gave 16 lectures on “PIONS and NUCLEONS” from July 16\(^{th}\) to August 6\(^{th}\), 1954.

• Fermi passed away a few months later.

• Exactly one year later, on August 6\(^{th}\), 1955, an official commemorative ceremony was organised by SIF President Polvani in Varenna and Como in the presence of Fermi’s wife, Mrs. Laura Fermi Capon, and Fermi’s sister, Mrs Maria Sacchetti Fermi

• There, SIF President Polvani announced that the School would be named after Enrico Fermi
IN THE AULA OF VILLA MONASTERO IN VARENNA A BRONZE MEDALLION WITH HIS LOW-RELIEF EFFIGY WAS UNVEILED IN MEMORY AND IN HONOUR OF ENRICO FERMI

Also a porphyry plaque was placed bearing the 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”
Here in Italy where his memory is so alive and where so many have heard Fermi's lectures, I do not have to describe the remarkable fascination he could induce in any audience. He used no histrionics in his delivery. He was always calm and deliberate. The fascination lays 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.

From the official commemorative address of I.I. Rabi at the Tempio Voltiano in Como, in 1955

In 2008, 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"
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.
From the historical novel “I Promessi Sposi” (The Betrothed), by Alessandro Manzoni, Chapter 1

“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 also this Course will be a success and wish it will pave the way for further developments in this very fascinating field.

Have a pleasant and fruitful stay in Varenna