

## Enrico Fermi and the Dolomites

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### Abstract

Summer vacations in the Dolomites were a tradition among the professors of the Faculty of Mathematical and Physical Sciences at the University of Roma since the end of the XIX century. Beyond the academic walls, people like Tullio Levi-Civita, Federigo Enriques and Ugo Amaldi sr., together with their families, were meeting friends and colleagues in Cortina, San Vito, Dobbiaco, Vigo di Fassa and Selva, enjoying trekking together with scientific discussions. The tradition was transmitted to the next generations, in particular in the first half of the XX century, and the group of via Panisperna was directly connected: Edoardo Amaldi, the son of the mathematician Ugo sr., rented at least during two summers, in 1925 and in 1949, and in the winter of 1960, a house in San Vito di Cadore, and almost every year in the Dolomites; Enrico Fermi was a frequent guest. Many important steps in modern physics, in particular the development of the Fermi-Dirac statistics and the Fermi theory of beta decay, are related to scientific discussions held in the region of the Dolomites.

Between the end of the XIX century and the '50s, the Dolomite mountains have been a traditional vacation destination for the mathematicians and the physicists of the University of Rome, together with their families. The tradition begun with a small community of mathematicians, among which Tullio Levi Civita (1873 - 1941), Federigo Enriques (1871 - 1946), Guido Castelnuovo (1865 - 1952) and Ugo Amaldi sr. (1875 - 1957). Among the destinations were Cortina d'Ampezzo, San Vito di Cadore, Dobbiaco, Vigo di Fassa and Selva di Val Gardena, where the professors and their families could enjoy trekking together with scientific discussions [1, 2].

The tradition was transmitted to the next generations and the younger scientists added to the predilection of

the fathers for the long stays in the mountains a passion for physical exercise, which led them to a more active practice of mountain sports.

The group of via Panisperna was directly connected to this tradition: Edoardo Amaldi (1908 - 1989), the son of the mathematician Ugo sr., and General Secretary of CERN<sup>1</sup> in its provisional phase (1951 - 1954), rented at least during two summers, in 1925 and in 1949, and in the winter of 1960, a house in San Vito di Cadore, and almost every year in the Dolomites; Enrico Fermi (1901 - 1954) was a frequent guest.

In the '20s of last century Enrico Fermi was in San Vito di Cadore, a guest of Taresina Menegus, from Ruseco; later he rented a house in Cortina, and in 1925 he came to San Vito to meet the Amaldi family who

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<sup>1</sup>This was in the first years of CERN the title of the charge now called Director General.



Figure 1: San Vito di Cadore in the '20s of last century.

were renting part of the house of Tita Menegus, another member of Menegus family. One could hear “tutte le sante notti” (every holy night) the noise of hand-cranked mechanical calculators [3].

In 1925 the young Edoardo Amaldi spent several days with Enrico Fermi, then interim professor of theoretical mechanics in Firenze, during a long bike ride on the Dolomites. A deep friendship was born, and the interest of Edoardo Amaldi for physics.



Figure 2: Summer 1926: Fermi (left) and E. Amaldi (right) during an excursion.

The summer of 1925 in the Dolomites was not only the key of a new friendship, but was also at the root of an article changing the history of physics.

In 1925 Wolfgang Pauli (1900 - 1958) announced his exclusion principle. Fermi invited in the Dolomites his friend Ralph Kronig (1904 - 1995), a young brilliant physicist, who had just concluded his PhD thesis and joined the company. In January 1925 Kronig had first proposed electron spin after hearing a seminar by Pauli in Tübingen (Heisenberg and Pauli first rejected the idea!). Discussing with Kronig, Fermi sketched a paper in which he applied the Pauli principle to an ideal

gas, employing a statistical formulation now known as Fermi-Dirac statistics [4].



Figure 3: Enrico Fermi climbing in the Dolomites.



Figure 4: Fermi and Edoardo Amaldi playing *bocce* (the Italian lawn bowling game) in San Martino di Castrozza, 1938.

A visit to Cortina and in Val Gardena by Fermi is reported also in 1926, the year in which he was assigned the chair of theoretical physics in Roma.

Vacations in the Dolomites and scientific activity continued to blend together. By the end of 1933 Fermi conceived his theory of beta decay, which was eventually published early in 1934 [5]. Emilio Segrè (1905 - 1989) vividly recalls how Fermi explained the basic ideas of the theory to the younger members of the team, squeezed in a tiny hotel room in val Gardena, during the Christmas holidays they were spending skiing in the Dolomites [6].

Fermi loved physical exercise and hiking in the mountains, but was not really an experienced climber, as Franco Rasetti remembered: “Fermi was not a mountain

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