

Obituary

Franco Rasetti (1901–2001)

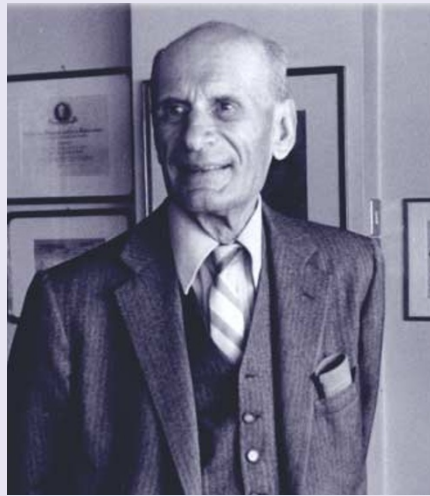
When Franco Rasetti died on 5 December 2001, the scientific world lost one of its most prolific generalists. Rasetti was a member, with Enrico Fermi, of Italy's celebrated 'via Panisperna' research group in the 1930s. He was an acknowledged authority not only in spectroscopy, nuclear physics and cosmic radiation, but also in palaeontology and botany. He made valuable contributions in optics and entomology; published scores of papers; collected, classified and named hundreds of palaeontological specimens; and his book on Alpine flora has sold tens of thousands of copies.

Rasetti was born in Pozzuolo Umbro, Italy. He inherited a flair for natural science — his father was a professor of agricultural entomology and botany, and his mother was an accomplished artist, specializing in entomology. They educated the young Franco themselves. At just seventeen, he published his first paper, on the insects of Pisa and Lucca.

When the family moved to Pisa, Rasetti met a young Roman called Enrico Fermi. Fermi encouraged Rasetti to study physics rather than entomology and, on long walks, the two engaged in furious debates about scientific disciplines. In the end, Fermi won Rasetti over, and the two enrolled in the sparsely attended postwar physics course at the Pisa Institute. Rasetti then moved to Florence where he completed his PhD.

The friendship between the two matured into a fruitful professional collaboration. Rasetti was the master of experimental work, whereas Fermi had a more theoretical bent. By 1927 their reputation had grown such that Orso Mario Corbino invited them to join him at the Physics Institute of Rome. With Edoardo Amaldi, Emilio Segrè and Oscar D'Agostino, they became the famous via Panisperna group — named after the address of the institute — which was to revolutionize Italian, and indeed international, physics.

Inspired by Rasetti and Fermi, the group developed research programmes, enrolled graduate students and visited other laboratories. They imported experimental techniques — and invented and exported their own. In particular they started investigating the transmutation of elements by neutron bombardment. They quickly discovered sixty new radioactive nuclei and used slow neutrons to induce the fission of uranium. This work led to the patent of the chain-reaction process — of which Rasetti was the last surviving



Physicist and palaeontologist

holder — and eventually to the development of nuclear reactors and a multi-billion-dollar industry.

In the midst of this activity, Rasetti managed to spend some time at the California Institute of Technology in Pasadena. There, he cobbled together equipment to investigate the newly discovered Raman effect — the imprint on scattered light of the vibrational levels of a medium's molecules. His studies in 1929 of the effect in hydrogen, oxygen and nitrogen were hailed as the year's outstanding work in spectroscopy. His famous spectrum of the Raman effect in nitrogen has been reproduced in many texts.

As the storm clouds of the Second World War gathered, research conditions in Italy became difficult. In 1938, Segrè and Fermi left for the United States; Rasetti was courted by Université Laval in Québec, Canada, as well as several larger US institutions. He chose Laval to avoid becoming involved in war-related research — unlike his friend Fermi, who became a central figure in the Allied project to develop the nuclear bomb. Rasetti was not a pacifist: his objections to the war were not moral or political, rather, he simply considered war to be foolish and did not wish to be involved.

On his arrival at Laval in 1939, Rasetti was given the daunting task of creating a physics department from scratch. But within eight years a solid physics programme was turning out dozens of honours students, and research was burgeoning in several fields. It was at this time that I met Rasetti, and became his

last graduate student at Laval. He had developed equipment and techniques for studying high-energy cosmic rays, and had measured the half-life of the recently discovered particle, the ρ meson. Just as in Rome, his inventions and techniques were duplicated in many laboratories.

In Canada, Rasetti continued his life-long habits of walking and mountain-climbing. An interest in Canadian geology led him into palaeontology and then to trilobites — fossilized marine creatures of the Cambrian era. Rasetti came to be a major influence on the palaeontological scene. He sought out trilobite fossils everywhere, collecting thousands of specimens, which he described, classified and in many cases named. He developed techniques for preserving and photographing them for journals, and his collection rivalled that of Washington's Smithsonian Institution. Just as he had been honoured for his work on nuclear physics and Raman spectroscopy, Rasetti received numerous awards for his contributions to palaeontology; for example, in 1952 he won the Charles Doolittle Walcott Pre-Cambrian Research Medal, which is awarded every five years by the US National Academy of Sciences.

At the end of the Second World War, Rasetti finally moved to the United States, leaving Laval for Johns Hopkins University. There his research centred on radioactivity, particularly the gamma-ray spectra and decay schemes of thorium, ionium and radon. In 1949 he married Marie Madeline Hennin, a Belgian he had previously met in Québec. The couple retired to Waremmé, Belgium, in 1977, and it was there that Franco Rasetti died, aged 100.

Today, we hear a great deal about scientific fraud, and commissions and committees on scientific ethics abound. For Rasetti, scientific honesty was axiomatic and automatic. We speak of research teams and networks of research groups, but Rasetti considered that the autonomy and independence of the individual scientist were paramount. We hear of national scientific strategies and policies, but Franco Rasetti resisted politics, believing that the fruits of science were for all humanity.

His work and writing are noted for the elegance, simplicity and beauty which he considered to be the innate characteristics of science. Several books and biographies attest to this, most recently the biography by Danielle Ouellet and René Bureau: *Franco Rasetti — physicien et naturaliste* (Guérin, 2000).

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