

In memoriam: Jean-Pierre Blaser

by Werner Joho, Villigen, 22 September 2019

At the age of 96 J. P. Blaser, the former director of SIN, the Swiss Institute of Nuclear Research, died in his home in Switzerland on the 29th of August 2019.

In 1948 J. P. Blaser finished his studies in physics at ETH Zurich, the Swiss Federal Institute of Technology. Afterwards he participated in the development of a cyclotron at ETH, built by professor Paul Scherrer during the second world war. In 1959 he was appointed as successor of Paul Scherrer, a popular lecturer at ETH, and inherited from him the planning group for a new cyclotron.

Originally Paul Scherrer wanted to copy the 88-inch cyclotron at Berkeley, California, and use it for research in nuclear physics. However J. P. Blaser wanted to realize a much more ambitious project. After getting advice from accelerator experts at CERN, among them Pierre Lapostolle, he proposed a 500 MeV cyclotron for the production of mesons. The key for such a meson factory was to extract the high intensity proton beam with very low losses. The competing projects for such a facility solved this problem with different approaches: At Los Alamos a Linear Accelerator was built, while the Canadian team TRIUMF in Vancouver planned to accelerate H⁻ ions and extract them by stripping them to protons.

The leader of Blaser's cyclotron group was Hans Willax, who was previously delegated by Paul Scherrer to Berkeley for getting some expertise with cyclotrons. He realised, that a conventional cyclotron would have high losses at extraction. In 1962 he came up with the brilliant idea to break up the cyclotron magnets into separate sectors. This left space in between for high voltage cavities. This concept of a ring cyclotron ensured a large separation between the turns and thus very low losses on the extraction septum. J. P. Blaser immediately enthusiastically supported this new idea and pushed forward to get this expensive project approved by the Swiss government. Against all odds and against some strong opposition even from the physics community he finally succeeded. In 1968 he founded the Swiss Institute for Nuclear Research (SIN) and was its director for the next 20 years.

Experiments at CERN showed, that the production of Pions would strongly increase with energy. In a last minute decision (supported by calculations from the author!) the energy of the cyclotron was increased from 500 MeV to 590 MeV. Even top accelerator specialists like the late Henry Blosser had doubts, that the SIN crew would reach the ambitious design goal of 100 μ A, but Blaser and Willax were convinced, that the ring cyclotron had the potential for even higher intensities. They anticipated, that the original 72 MeV injector cyclotron, provided by the Philips company, would be the limiting factor and eventually would have to be replaced. Even before the construction of the ring cyclotron was completed the concept for a new Injector II was worked out. In the accelerator building a corresponding opening, which we called "the Philips provocation hole", was provided during construction.

In January 1974 the first protons were extracted from the ring, and at the end of 1976 the design current of 100 μ A was reached. More highlights followed:

- 1985: First 72 MeV protons from the new Injector II.
- 1990: New high intensity targets for the production of mesons.
- 1995: With an upgraded RF-system 1.4 mA were achieved. With this current, the SIN cyclotron surpassed the Los Alamos Linac in beam power. This was a special pleasure for the cyclotron pioneer Henry Blosser, who as a true gentleman, admitted that he completely underestimated the potential of the Ring Cyclotron.
- 1996: Commissioning of the Neutron Spallation Source SINQ, replacing reactors as neutron sources
- 2006: Four new copper cavities with a voltage of 900 kV
- 2009: With 2.4 mA protons at 590 MeV, a new world record of 1.4 MW in beam power was achieved. This record still holds up to today.

These results gave J. P. Blaser a great satisfaction, even after his retirement in 1990. Before that date he initiated in 1988 the new "Paul Scherrer Institute, PSI", a combination of his own Institute SIN and the neighbouring reactor institute, EIR. For its first two years he acted as its director. All these achievements are summarized in a book by Andreas Pritzker: "History of the Swiss Institute for Nuclear Research".

From the beginning of the accelerator project J. P. Blaser saw the possibility to use particle beams for the irradiation of tumours. The first step was using pions for the treatment of deep seated tumours. A superconducting solenoid was constructed for this purpose and was in operation from 1982 to 1992. In 1984 the irradiation of eye tumours started, using the injector cyclotron. Up to today more than 7000 patients were treated this way. For deep seated tumours Eros Pedroni developed in 1996 the so called spot scanning technique. A small fraction of the 590 MeV beam was first degraded and then directed towards a rotating Gantry. Later a new superconducting cyclotron was acquired and two more Gantries are now in operation.

J. P. Blaser strongly supported all activities in medical application of cyclotrons. It was thus no surprise, that he was willing to give his advice to a corresponding new cyclotron project in South Africa. His help was strongly appreciated and in 1990 he was elected "Foreign Associate of the Royal Society of South Africa" for his efforts.

J. P. Blaser was blessed with great intuition, based on a thorough knowledge of the basic laws of physics. He was open to new and unconventional ideas. He fully supported young scientists and motivated them with his trust in their abilities. Team spirit was very high on his list of priorities. In his free time he enjoyed exploring the landscapes of Switzerland either by foot or as a pilot with an airplane. But the top priority was his family. He enjoyed enormously the company of his wife Frauke, their two daughters Claudine and Nicole and their four grandchildren. With Jean-Pierre his family and the accelerator community loses a great personality.

*Andreas Adelman delivered an obituary to the life of J. P. Blaser on
24 September at Cyclotrons'19, Cape Town, South Africa*