

Marietta Blau – Sterne der

Zertrümmerung by Robert Rosner and Birgitte Strohmaier (eds), Böhlau Verlag. ISBN 3205770889, €29.90.

Marietta Blau – Sterne der Zertrümmerung (stars of fragmentation) is the third in a new series devoted to scientists from Austrian history, following on from those about Hans Thirring and Ludwig Boltzmann.

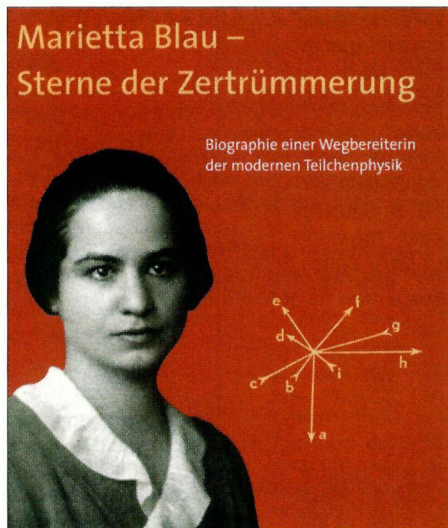
In brief, Marietta Blau was born in Vienna in 1894 to a moderately well-to-do Jewish family, and was among the first women to study physics at the University of Vienna. In 1923 she joined the Radium Institute in Vienna, but was forced into exile in 1938. After five years in Mexico and 16 years in the US she returned to her native Austria in 1960, aged 66 and badly in need of medical treatment. She died of cancer in Vienna in 1970.

The book begins with a long and well-documented biographic chapter written by the editors. Here the history of the Radium Institute is described so vividly that I had the feeling I was actually moving around the building and meeting the people working there. The reader is presented with some interesting and at times surprising details.

For example, more than one-third of the researchers at the Radium Institute were women and the majority of Blau's PhD students were female. However, this was not a general phenomenon during the 1930s. After leaving Austria, aided by Albert Einstein, Blau found refuge in Mexico as a staff member at the Polytechnic Institute in Mexico City between 1939 and 1944. One of the pictures in the book shows the teaching staff at the institute in 1940, and out of 58 people in the photo, Blau is the only woman. (It is interesting to compare this with our own time. A recent picture in *CERN Courier* (September 2003 p27) shows the participants at a conference on supergravity, and three out of the 52 are women.)

Another surprising fact is that the majority of the researchers at the Radium Institute, both male and female and including Blau, were unpaid. Perhaps they were working there simply to have a meaningful life? The book quotes the famous Austrian physicist Lise Meitner to have said in 1963: "I believe that all young people think about how they would like their lives to develop. When I did so, I always arrived at the conclusion that life need not be easy; what is important is that it not be empty. And this wish I have been granted."

The book also describes how Blau turned



down academic job offers during her most productive years to take care of her sick mother, and her close collaboration with Hertha Wambacher (1903–1950), who having originally studied chemistry had turned to physics and chosen Blau as her supervisor. After Wambacher had finished her doctorate, the two women had an extensive and fruitful collaboration for the next six years, in particular in trying to improve the emulsion technique for detecting particles. However, much of their relationship remains a great mystery. Wambacher was a member of the Nazi party, but obituaries for her shed no light on this matter as they deal exclusively with her work.

Other topics covered in detail include Blau's work before and after the Second World War, and there are reminiscences from those who had contact with Blau in the latter stages of her career when she was in her sixties. Blau's last PhD student worked from 1960 to 1964 analysing an experiment done at CERN in which emulsions were exposed to a beam of protons. This was one of a large number of experiments at CERN at this time that used emulsions. At the end of the book there is a reprint of three of Blau's papers, two of which were with Wambacher, and a list of all her publications.

Blau was an expert on nuclear emulsions, a detection technique with old roots. In 1937 she and Wambacher observed 31 "stars" in emulsions exposed to cosmic rays. The stars were made by collisions in the emulsions, which produced several particle tracks emanating from the collision point; one of the stars had no less than 12 tracks! The observation of these stars drew the attention of the

scientific community to emulsions, which were considered by some as being rather out of date. However, to claim that the work by Blau and Wambacher was a prerequisite for the discovery of the pion is a gross exaggeration. Emulsions had to be enormously improved to achieve the required sensitivity. One of the authors in the book also claims that Blau must have been frustrated that Cecil Powell was awarded the Nobel prize for a discovery using her method, so much so that she erroneously attributed the first observation of the negative pion to Don Perkins. However, this speculation is unfounded; Blau was in fact giving a correct account of what had happened (see Letters, p50). Another point made concerns the nomination of Blau and Wambacher for the Nobel Prize in Physics. By itself this is not a measure of the highest excellence as every year there are a large number of such nominations.

The literature on emulsion techniques is vast and it is very difficult to do justice to all those who have contributed to this field. Nonetheless, I was deeply touched by the portrait of this exceptional woman, described as shy, gentle and highly dedicated to her métier, but who had the misfortune to live in a hostile environment, a victim of a sick society. *Cecilia Jarlskog, CERN.*

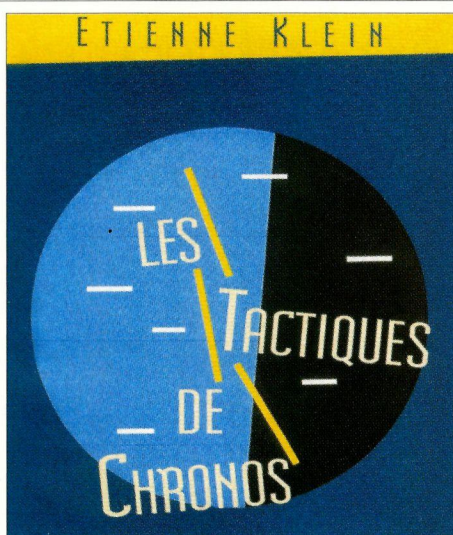
Les tactiques de Chronos by Etienne Klein, Editions Flammarion. ISBN 208210091X, €18.00.

Time is an elusive concept and presents itself in manifold and disparate guises. As a result, dictionaries mention it in relation to fields as varied as choreography, economics, horse-riding, linguistics, liturgy, seafaring, sports, forestry, hunting and, obviously, physics. In his book *Les tactiques de Chronos* (Chronos's tactics), Etienne Klein sheds some light on the ideas each of us have of the disconcerting parameter that is time.

With his considerable store of philosophical and scientific knowledge, the author sets out to help the reader understand the concept of time. However, the meaning of time remains ambiguous and the book warns of the difficulties in providing a definition. The reader is reminded of the words of Saint Augustine: "What, then, is time? If no one asks me, I know what it is. If I wish to explain it to him who asks, I do not know."

Klein attempts to assist Saint Augustine. He begins with a summary of the various philo- ▷

sophies put forward over the ages, before introducing the concept of physical time with Galileo, who included time as a variable in dynamic equations. The concept of time was revolutionized by relativity theory and lost its absolute quality. Quantum mechanics suggests that going back in time is like crossing over into the world of antimatter. Klein goes on to discuss the "arrow" of time, which stipulates the irreversibility of macroscopic phenomena, and is illustrated by effects such as entropy and the evolution towards more probable states. This brings him to a discussion of CP violation, which implies T violation, in microscopic phenomena. The author does not shy away even from the most speculative of concepts, such as discontinuous time or time with several dimensions as a possible consequence of superstring theory. On the anecdotal side, the reader learns who wrote the article on time in Diderot and d'Alembert's encyclopaedia. It was J J Rousseau. We also find out to whom the phrase "eternity is long, especially towards the end" can be attributed – a list that over the years has



included Franz Kafka, French humorist Pierre Dac and Woody Allen – and about S B Preuss, the physicist who put his name to just one article, albeit alongside Albert Einstein's.

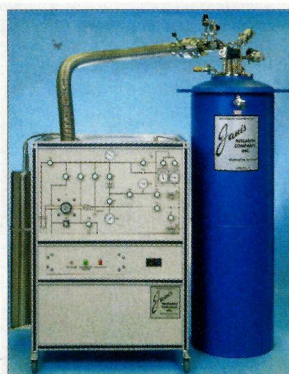
While reading the book, which is a pleasure, it becomes clear that physics has made an

important contribution to our understanding of time. It also becomes evident that a subjective time exists that is distinct from physical time, or if you prefer an individual time that is superimposed on universal time. Is not subjective time evidence of our relationship to physical time? This question is addressed in the final chapter of the book, entitled "Has physics forgotten about death?". Life still transcends the laws of physics, and it may be that man's concept of time is defined by his awareness of his own mortality. This hypothesis remains unanswered and the book is rounded off with a comprehensive bibliography of the sources used by the author.

Having finished the book, the physicist is left with the feeling of being closer to the philosopher, and maybe the philosopher will be better able to understand the need to take into account the major advances in physics in order to provide a more complete picture of the human experience.

François Vannucci, Université de Paris 7 and IN2P3.

SUPPLIER INFORMATION



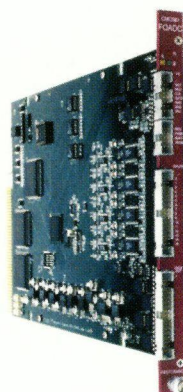
Janis Research Company

^3He - ^4He dilution refrigerator

Janis Research is offering the model JDR-100 Dilution Refrigerator with:

- ^3He mechanical pump only
- 15 mK guaranteed base temperature (10 mK expected)
- 150 μW guaranteed cooling power at 100 mK (180 μW expected)
- Sample in vacuum
- Integrated safety features
- Resistance and CMN calibrated thermometers

Janis Research Company Inc,
2 Jewel Drive, Wilmington, MA 01887, USA
Tel: +1 978 657 8750
Fax: +1 978 658 0349
E-mail: sales@janis.com
Web: www.janis.com



CMC MAC

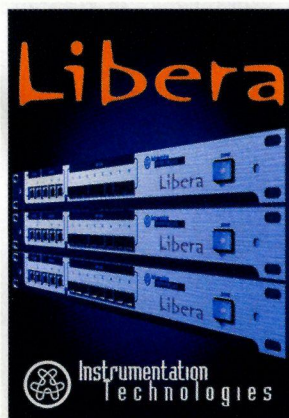
Introducing the CMC081, a new version of an old standard 16 Channel FERA Compatible Charge Integrating ADC

It emulates a 4300b in 11 bit mode on power up. Same connectors, same commands, same sensitivity, and less than 10 microseconds conversion time. Just plug it in your existing system and go, no changes required.

Configure a few registers and you have a dual range ADC with 16 bit dynamic range. Both modes add a sliding scale for excellent DNL. The sensitivity is 30 fC per LSB on the low range, Multi-event data buffers for low dead time and FASTCAMAC readout.

The complete spec sheet is at www.cmcamac.com. Call or write for more information.

CMC MAC, 24 Halley Drive, Pomona, NY 10970 USA
Tel: +1 (845) 364 0211
E-mail: info@cmcamac.com



Instrumentation Technologies

Libera...frees you from traditional hardware and software limitations.

Instrumentation Technologies is unveiling a completely new product line: Libera. Libera enables trouble-free commissioning, accurate beam position monitoring, and local and global feedback building.

For more info about this all-in-one, feedback-ready, and customizable product, subscribe to the I-Tech newsletter at: <http://www.i-tech.si>.

Instrumentation Technologies d.o.o., Srebrenicev trg 4a, SI-5250 Solkan, Slovenia

Tel: +386 (0)5 3311700

Fax: +386 (0)5 3311719

E-mail: i-tech@i-tech.si

Visit us at APAC 2004 in Gyeongju, Korea.

SPECTRA GASES



Specialty Gases and Equipment

Spectra Gases

Stable isotopic and rare gas catalogue

FREE!!! THE STABLE ISOTOPIC AND RARE GAS CATALOGUE IS NOW AVAILABLE FROM SPECTRA GASES, WHICH HAS FACILITIES IN THE USA, THE UK, GERMANY, JAPAN AND CHINA. THIS NEW CATALOGUE CONTAINS SPECIFICATIONS ON HELIUM-3, DEUTERIUM, NEON-21, NEON-22, OXYGEN-18, XENON-129, XENON-136 AND OTHER STABLE ISOTOPIC GASES, AS WELL AS EXCIMER LASER GASES, OXYGEN-18, KRYPTON AND CARBON-13. RELATED GAS-HANDLING EQUIPMENT FOR STABLE ISOTOPIC AND RARE GASES, SUCH AS LOW INTERNAL VOLUME REGULATORS, ARE HIGHLIGHTED THROUGHOUT THIS NEW COLOUR CATALOGUE.

USA: Tel: +1 908 252 9300; Fax: +1 908 252 0811

UK: Tel: +44 (0)1353 865 470; Fax: +44 (0)1353 865 472

GERMANY: Tel: +49 6073 72620; Fax: +49 6073 7262200

E-mail: INFO@SPECTRAGASES.COM

Web: www.spectragases.com