Professor Johann Arbocz (1932 – 2019)

See:

http://www.worldcat.org/identities/lccn-n82-12168
http://lr.tudelft.nl/index.php?id=25975&L=1
http://truebookstore.org/manufacturerJohann-Arbocz/mid62676/
http://www.abebooks.co.uk/book-search/author/singer-j-weller-tanchum-arbocz-johann/
http://openlibrary.org/authors/OL2128891A/Johann_Arbocz
http://www.amazon.com/s?ie=UTF8&rh=i%3Aaps%2Ck%3AJohann%20Arbocz&page=1
http://www.efluids.com/efluids/pages/aiaa-fellows-01.htm

Obituary by Roeland De Breuker and Jan Hol of the Technical University of Delft:

In memoriam, Prof. Dr. Johann Arbocz 1932-2019)
Johann Arbocz was born in Füzesgyarmat, Hungary, on 2 October 1932. After his high school education in Germany, he moved to Brasil to work for the local aircraft industries. Roughly ten years later, he decided to make a career switch and relocate to the United States of America where he pursued his BSc, MSc and PhD degrees. After obtaining his PhD degree in 1968 from the California Institute of Technology (CalTech), he became assistant and associate professor at Northrop Institute of Technology and simultaneously research fellow and later senior research fellow at CalTech. He already established his name in the buckling research area working together with Babcock and Sechler.
Johann met the renowned Delft professor Warner T. Koiter at CalTech in 1973. Professor Koiter inspired Johann Arbocz to come to Delft, where Johann joined him in 1976 as the successor to professor van der Neut. Johann was the last professor of TU Delft Aerospace to be appointed personally by the then reigning Queen Juliana, of which he was rightfully very proud. He became chairholder of Aerospace Structures and Computational Mechanics in 1997 and stayed in this position until 2001 when he retired at the age of 69. This was not the norm at the time, but Johann Arbocz arranged a 25-year contract when he was hired to ensure that he could carry out all the research plans he envisioned. After his retirement, he went to NASA as a visiting professor for one year. Upon his return to The Netherlands, he came back to Delft as an emeritus professor, still working at the faculty most days of the week. In 2014, he decided to put down his pencil for good.
The scientific legacy of Johann Arbocz is unmeasurable. To mention a non-exhaustive selection of his achievements, he co-developed STAGS-A with Almroth, a design tool for shell buckling. Together with his Delft co-workers, he developed the Delft Imperfection Databank for the analysis of imperfect shells. Following ideas from Starnes of NASA, he formulated and implemented an Improved Reliability Method of Buckling Load Calculations using Multi-Level High-Fidelity Analysis. This method was the foundation of the ESA Buckling Handbook and part of the work for NASA's improved knockdown factor. His work on imperfect shells was complemented by nonlinear vibration analysis and the entire vibration and buckling research was eventually synthesised in the analysis programme for imperfect shells called DISDECO. Johann Arbocz continued to build his research on these foundations in collaboration with NASA and ESA, and he expanded his research group both in numerical and experimental research activities.
Johann Arbocz was not only an excellent researcher; he was also an inspirational teacher. He taught many a course in structural analysis. He was well-known for filling the blackboard from top left to bottom right in precisely 45 minutes, after which he would appoint a student to erase the blackboard during the break. Of course, that very blackboard would be filled again in the next session. One of his more memorable expressions during a lecture was: "If you want to pass this course, you have to suffer". And of course, we must never forget his analogy to the famous Dutch candy "Wybertje" when he wanted to indicate the shear stress direction in a plate element unambiguously. Furthermore, Johann Arbocz always pointed out the difference between an engineer and an "ingenieur", the Dutch equivalent, namely that an "ingenieur" does not only have to engineer artifacts but has to be "ingenious" at the same time.
Finally, Johann Arbocz was not only an excellent researcher and an inspirational teacher, but he also had the unusual ability to be a leader for his co-workers and at the same time their colleague who would inspire them, and allow and encourage them to grow. Margot, his dear wife, was the mother of his research group, welcoming every new PhD student personally and taking care of every group member. Together, they made Aerospace Structures and Computational Mechanics a place of high-quality research and, at the same time, an enjoyable environment to work. Johann Arbocz will remain an example for many generations of researchers and

professors in terms of research, education and leadership.
-----Roeland De Breuker and Jan Hol, Delft, 23 July 2019

Tribute to Professor Johann Arbocz on his 70th Birthday

Johann Arbocz was born in Füzesgyarmat, Hungary, on 2 October 1932. He received his Elementary and High School education in Hungary and Bad Kreuznach in Germany. In 1953 he emigrated to Sao Paulo in Brazil where he worked as a Technical Draftsman in the local Aircraft Industries. In the early 1960s he dropped other ambitions and decided to study and make a scientific career in the United States of America. He received his B.S. degree in aerospace engineering in 1963 from the Northrop Institute of Technology and M.S. and Ph.D. degrees in Aeronautics from the California Institute of Technology (Caltech) in 1964 and 1968, respectively, working with Professor E.E. Sechler. From then on he was Assistant and Associate Professor (1969) at Northrop and at the same time Research Fellow and later Senior Research Fellow at Caltech (1968–1976). During this time he was an active member of the shell buckling team of Caltech which consisted of Babcock, Sechler and Arbocz along with several graduate students, postdocs and visiting scientists. The work was always founded on careful experiments coupled with theory and numerical solutions. Several benchmark publications from this period which have since become classics are listed below.

In 1976 Arbocz was offered the professorship of Aerospace Structures at the Delft University of Technology as successor of the late Professor Arie van der Neut. After a reorganization of the Department of Aerospace Engineering in 1997 he occupied the Chair of Aerospace Structures and Computational Mechanics. At Delft, Johann continued the work he started at Caltech while keeping the many scientific contacts he had in the USA alive for example by cooperating with Almroth to make the STAGS-A program a better design tool for shell buckling. His cooperation with Singer and his group at the Technion (Singer, Rosen, Weller, Abramovich, a.o.) blossomed and indeed continues until today and includes theoretical and experimental investigations of buckling and vibrations of stiffened shells. With Abramovich a first publication on the so-called Delft Imperfection Databank was released in 1978. In the early 1980s cooperative efforts with Elishakoff resulted in work on a statistical analysis approach of geometrically imperfect thin-walled shells. The paper was presented in an invited lecture at the IUTAM Symposium on collapse of structures in London in 1983. With students and Ph.D. student Da Kang, research on the influence of imperfections on non-linear vibrations of shells was started around 1984. A research fellow was attracted to start setting up a programming environment, enabling shell designers full access of a range of design and analysis programs for imperfection sensitive shells, DISDECO. This work, later on mainly carried by his assistant Jan Hol, found interest at the European Space Agency ESA and at NASA.

In the period thereafter the flavor of the activities changed from deterministic towards probabilistic techniques where Arbocz emphasizes a hierarchical approach for shell design. His philosophy: to get a good view on a shell's behavior one should apply programs based on simplified and well known theories. This allows the designer to understand the behavior of the shell and improve the accuracy of the solution gradually without reverting to lengthy computer simulation ("sledgehammer approach").
Many presentations and publications by Arbocz with Hol, with his Ph.D. student Zhang and with a number of visiting professors and research fellows (Baruch, Cederbaum, Nemeth) on this theme followed in the period from then on till now. From 1990 on, NASA started funding the project and the funding and cooperation with Jim Starnes's group continues until now. The cooperation with NASA focused on two aspects; the first to develop shell analysis methods including the use of measured imperfection data; the second to improve the imperfection data acquisition methods so that they become usable analysis tools, work done by Johann's assistant professor Jan de Vries. At about 1990 Johann convinced Eduard Riks to join his group as an associate professor. Eduard continued his work in developing advanced numerical procedures which amongst others resulted in the implementation of techniques to simulate dynamic mode jumping during the buckling of thin-walled structures under compression, a subject which connects to early experimental work of the Caltech shell buckling group.

Recently (1998 and 2001), after several years of work, Singer, Weller and Arbocz published two comprehensive volumes which are unique in their emphasis on experiments on thin-walled structures and are bound to become classics:

Buckling Experiments—Experimental Methods in Buckling of Thin-walled Structures
Vol. 1: Basic Concepts, Columns, Beams and Plates (1998).
Vol. 2: Shells, Built-up Structures and Additional Topics (2001)

Johann remained active in the shell community by participating in and by organizing several important conferences. In 1994 he co-chaired the Euromech Colloquium 317 "Buckling Strength of Imperfection Sensitive Shells" organized by Gerry Galletly in Liverpool. This year, 2001, together with Walther Wunderlich he organized and co-chaired Euromech Colloquium 424 "Buckling Predictions of Imperfection Sensitive Shells" in the Netherlands. In addition, he was one of the initiators of the Dutch Graduate School of Engineering Mechanics and the Koiter Institute Delft. In both he still is an active member.

As a teaching professor at the Delft University of Technology, Johann Arbocz always aimed to emulate the level of the top private universities in the USA. This, despite the fact that in the Dutch educational system selection at entry level is not allowed. He therefore wholeheartedly supported the Department's decision to implement an ABET accreditation equivalent, which indeed was initiated in 1995. It also is not a coincidence that his group was ranked amongst the best in the department. With a few of his colleagues he stood for scientific quality. In his opinion, a strong theoretical background is essential for engineering graduates. In this respect he did not fear to carry a heavy educational load. With his Chair he was responsible for almost all lectures in Mechanics in the bachelor's program of the department. Apart from this he taught his own expert lectures in the Master's program. In the 25 years of being a full professor at the TUDelft, he supervised 75 M.Sc. and 11 Ph.D. students. In Delft he was an example of complete dedication to science, rarely taking a vacation, never absent being sick. Not only his students were given great attention, also his staff and assistant and associate professors found in him a stimulating leader as well as caring person.

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Left-to-right: Professors Charles Babcock (1934-1987), Johann Arbocz (1932-2019). Josef Singer (1923-2009): the famous "Caltech Shell Buckling Group" in 1969