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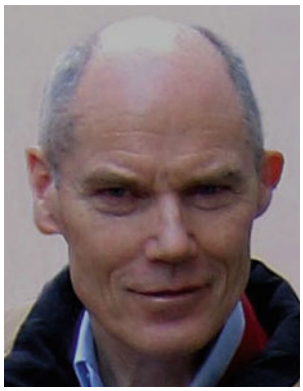
OBITUARY

# Obituary: Hans Troger 1943–2010





Hans Troger, Professor of Mechanics at the Faculty of Mechanical and Industrial Engineering, passed away on February 22, 2010, after a long and painful illness, shortly before his 67th birthday.

Hans Troger was born on March 11, 1943, in Villach, Austria. As a war widow, his mother had to care for the living of the family of four. This explains the part of his sister in the education of her significantly younger brother Hans. In 1966, he graduated from Vienna University of Technology to Dipl.-Ing. of Mechanical Engineering. Graduation to Dr.techn. followed in 1970. The title of his dissertation reads "Investigation of the driving stability of a semitrailer unit". From 1970 to 1972, Hans Troger was an Assistant at the Institute of Rational Mechanics in the Department of Civil Engineering of Vienna University of Technology. At that time, the late Prof. Gerhard Heinrich, Full Member of the Austrian Academy of Sciences, was Head of this Institute. From 1972–1977, Hans Troger worked as an Assistant at the Institute for Mechanics in the Department of Mechanical Engineering, the Head of which then was the late Prof. Heinz Parkus, also a Full Member of the Austrian Academy of Sciences. Hans Troger spent the academic year 1975/76 as a Max Kade Fellow, selected by the Austrian Academy of Sciences, at the University of California at Berkeley. In 1977, he obtained the *Venia Docendi* for Mechanics. As of October 1, 1979, he was appointed to Full Professor of Mechanics at the Institute for Mechanics in the Department of Mechanical Engineering of Vienna University of Technology, succeeding Prof. Parkus.

In the academic years 1985/86 and 1986/87, Hans Troger served as Chairman of the aforementioned Department. He held guest professorships at the Universities of Metz (1988), Pavia (1994), and Rome (1995), the Technical University of Hamburg-Harburg (1997), the University of Illinois at Urbana Champaign (1998), and at the Pontifical Catholic University of Rio de Janeiro (PUC-RIO) (1999). These prestigious guest professorships document the international character of Prof. Troger's scientific activities. Since 1998, he served as Chairman of the Austrian National Committee for Theoretical and Applied Mechanics, a delegation of the Austrian Academy of Sciences in the frame of the International Council for Science (ICSU).

Hans Troger was an internationally highly distinguished scientist in the wide area of Mechanics of Solids. He was particularly concerned with the application of bifurcation theory, with chaos theory and with methods of dimension reductions in engineering. An excellent overview of applications of the local bifurcation theory is contained in the book "Nonlinear Stability and Bifurcation Theory", jointly authored by Hans Troger and his Associate Alois Steindl, published by Springer-Wien, in 1991. Essentially, three classes of nonlinear stability problems are treated in this book. The first one consists of problems of vehicle dynamics (road vehicles, rail vehicles, and ships), robotics, and of vibrations of liquid cross-flow hoses. The second class is concerned with the postbuckling behavior of statically loaded thin-walled structures, and the third one with applications of dimension reduction of dynamic as well as static systems by means of an extension of the classical Galerkin method. Such dimensional reductions represent an important area for applications in mechanical engineering.

Since the beginning of the nineties of the last century, Hans Troger was occupied intensely with the simulation of the dynamics of tethered satellites. In the frame of several research projects supported by the European Space Agency (ESA), his group developed a computer program for numerical simulation of the dynamic behavior of such satellites. They consist of two or more satellites connected by thin cables, revolving around a planet. In addition to the development of the simulation program, the problem of the stability of tethered satellites was treated with the so-called energy–momentum method.

Not only does this problem represent a great theoretical challenge, but it is also of great practical importance. Hans Troger's equally broad and deep knowledge about tethered satellites was of benefit to the book "Dynamics of Tethered Space Systems", co-authored by him and published by CRC Press, that appeared shortly after his death.

The research activities of Hans Troger are characterized by a strong reference to the scientific fundamentals of his field and the brilliant use of the mathematical tools required for the treatment of demanding mechanical problems. The great number of scientific papers that appeared in the best international journals in the area of solid mechanics (see the attached List of Publications) bears witness of Hans Troger's truly outstanding scientific achievements in all of the aforementioned subfields of mechanics of solids and beyond them.

In recognition of these achievements, Hans Troger received an honorary doctorate from the Budapest University of Technology and Economics, at the comparatively young age of 47 years. In 1993, he was elected to Corresponding Member of the Austrian Academy of Sciences and in 2002 to Full Member. For his excellent contributions to the nonlinear stability theory and bifurcation theory, he received, in the year 2000, the Erwin-Schrödinger Prize of the Austrian Academy of Sciences. He was also a longstanding co-editor of *Acta Mechanica* (1980–2005) and a member of the Editorial Board of several leading international journals in the area of Mechanics of Solids.

The heavy illness, to which Hans Troger finally fell victim, had broken out approximately 20 years ago. In addition to it, in the last years of his life, his health was progressively impaired. In spite of a nearly 6-month stay in hospital, which he terminated a few weeks before his death, his will to live remained unbroken. It was Ash Wednesday 2010, five days before his passing away, when I visited Hans Troger for the last time. Albeit physically already very weakened, he showed great interest in science and research, in general, and in scientific activities in his narrower scientific area, in particular. He was indeed a scientist with heart and soul!

Hans Troger was a dedicated academic teacher and researcher at Vienna University of Technology and a very active member of the Austrian Academy of Sciences. He regularly attended meetings of the Academy and participated in several committee and board meetings of Academy Institutes.

By Hans Troger's death, his sister, who is living in Germany, now has also lost her younger brother, to whose sickbed she hurried as often as possible and at whose deathbed she stayed. Vienna University of Technology and the Austrian Academy of Sciences, however, have lost not only an outstanding representative of the worldwide highly respected Austrian School of Mechanics but also a wonderful, modest person who always subordinated his personal state of mind to the cause and never created fuss about himself.

## List of Publications

### Monographs

1. Troger, H., Steindl, A.: Nonlinear Stability and Bifurcation Theory: an Introduction for Engineers and Applied Scientists. Springer-Verlag, Wien, New York (1991) (Since 1997 out of print)
2. Alpatov, A.P., Beletsky, V.V., Dranovskii, V.I., Zakrzhevskii, A.E., Pirozhenko, A.V., Troger, H., Koroshilov,V.S.: Rotatory Motion of Space Tether Systems. NAS of Ukraine, Djnepopetrovsk (2001) (404 pages, ISBN 966-02-2114-2)
3. Alpatov, A., Beletsky, V., Dranovskii, V., Khoroshilov, V., Pirozhenko, A., Troger, H., Zakrzhevskii, E.: Dynamics of Tethered Space Systems. Taylor & Francis Group, Boca Raton. London, New York (2010). ISBN: 978-1-4398-3685-9; p. 245

### Conference Proceedings and Special Issues

1. Küpper, T., Seydel, R., Troger, H. (eds.): Bifurcation: Analysis, Algorithms, Applications, Volume 79 of International Series of Numerical Mathematics. Birkhäuser Verlag, Basel (1987)
2. Küpper, T., Schneider, F., Seydel, R., Troger, H. (eds.): Bifurcation: Analysis, Algorithms, Applications, Volume 97 of International Series of Numerical Mathematics. Birkhäuser Verlag, Basel (1991)
3. Szemplinska-Stupnicka, W., Troger, H. (eds.): Engineering Applications of Dynamics of Chaos. Number 319 in CISM-Courses and Lectures. Springer-Verlag, Wien, New York (1991)
4. Schneider, W., Troger, H., Ziegler, F. (eds.): Trends in Applications of Mathematics to Mechanics. Longman, Essex (1991).
5. Rega, G., Troger, H. (eds.): Special Issue: Dimension Reduction of Dynamical Systems: Methods, Models, Applications. Nonlinear Dynamics, **41** (2005)
6. Kreuzer, E., Troger, H. (eds.): Special Issue: Modeling of Mechanical Systems Performing Nonlinear Oscillations. Mathematical and Computer Modeling of Dynamical Systems, **11**(3) (2005)
7. Troger, H., Benedittini, F., Lenci, S. (eds.): Special issue of "Nonlinear Dynamics" in honor of 60th birthday of Professor Giuseppe Rega. **47**(1–3) (2007)

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### Reports

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3. Mack, W., Troger, H.: Zum Reduktionsvorgang in der nichtlinearen Stabilitätstheorie. In: Schueller, G. (ed.) Konferenzbericht der Tagung "Mechanik und Industrie", pp. 249–266. Institut für Mechanik, Universität Innsbruck (1985)
4. ESA-Report (Phase 1). ESTEC Contract 8717/90/NL/JG(SC), p. 110 (1992)
5. ESA-Report (Phase 2). ESTEC Contract 8717/90/NL/JG(SC), p. 175 (1994)
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