

History of Rocketry and Astronautics

**Proceedings of the Thirty-Seventh History Symposium of
the International Academy of Astronautics**

Bremen, Germany, 2003

Otfrid G. Liepack, Volume Editor

Rick W. Sturdevant, Series Editor

AAS History Series, Volume 34

A Supplement to *Advances in the Astronautical Sciences*

IAA History Symposia, Volume 23

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AMERICAN ASTRONAUTICAL SOCIETY

AAS Publications Office
P.O. Box 28130
San Diego, California 92198

Affiliated with the American Association for the Advancement of Science
Member of the International Astronautical Federation

First Printing 2011

ISSN 0730-3564

ISBN 978-0-87703-563-3 (Hard Cover)
ISBN 978-0-87703-564-0 (Soft Cover)

Published for the American Astronautical Society
by Univelt, Incorporated, P.O. Box 28130, San Diego, California 92198
Web Site: <http://www.univelt.com>

Printed and Bound in the U.S.A.

Chapter 27

Pioneers from Other German-Speaking Countries: Austria*

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Abstract

In the early period of practical rocketry, during the 1920s and 1930s of the 20th century, several individuals originating from Austria (or the Austro-Hungarian Empire) made valuable contributions to the field. The most prominent were Hermann Oberth, the “father of Western Europe rocketry;” Max Valier, popular figure and experimenter; Franz von Hoefft, originator of a space plane design; Guido von Pirquet, a talented calculator of interplanetary spacecraft trajectories; Herman Potočnik (pen name Hermann Noordung), designer of a space station; and Eugen Sänger, designer of a horizontally launching and landing space plane. But several others, not so well known, have been active in the rocket circles. Worthy of mention are Franz Ulinski, originator of an electrical space ship design, and Friedrich Schmiedl, solid-fuel rocket experimenter for mail transport. Other experimenters with solid-fuel rockets for different applications (such as meteorological, hail weather, and signal rockets) were Rudolf Zwerina and Hermann Stofa. Additionally, several individuals were active, either promoting or contributing to space travel ideas, for example, Erich Dolezal, Karl Cerny, and others.

* Presented at the Thirty-Seventh History Symposium of the International Academy of Astronautics, 29 September to 3 October 2003, Bremen, Germany.

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Introduction

In the early period of rocket development, several pioneers originating from the former Austro–Hungarian Empire proposed their ideas to the new emerging field of interest. For reviews on their contributions the reader is referred to the reports by F. Sykora,¹ B. P. Besser and Sykora,² and Besser.³ Details about the work of one of the forerunners in Austria, Franz Ulinski, have been reported at the history meeting at the 2002 International Astronautical Congress.⁴ The following chapter will describe and summarize some proposals and work by contemporaries not so well known.

Austrian Society for High-Altitude Exploration

Franz von Hoeffft set up the first western European spaceflight club in Vienna in 1926, and the reader is directed to the excellent summary of the history of this group in Frank Winter's seminal book, *Prelude to the Space Age*, about rocket societies.⁵ In addition to the information provided, recently located documents about this society in the public Austrian archives could shed some complementary light on the activities of this group.

The formal application to the respective governmental authority for registration of the society was dated 12 January 1927, signed by the chair, Dr. Franz Hoeffft, and the secretary, Ing. Guido Pirquet.⁶ The official noninterdiction of the creation of the society was dated 22 January 1927. Franz Hoeffft and Guido Pirquet were usually addressed as “Franz von Hoeffft” and “Guido von Pirquet,” although official usage of titles of nobility, such as “von,” of Austrians had been forbidden according to Austrian law since 3 April 1919.

Another interesting detail to mention is that in the typed application, the name of the society is “Wissenschaftliche Gesellschaft für Weltraumforschung” (translated as Scientific Society for Space Research), and it has been changed to “Höhenforschung” (High Altitude Exploration) by handwriting. Other information included in the official file is about the closing of the society. In December 1932 the official governmental authority started an inquiry, because the society's formation had not been notified.

Franz von Hoeffft, who moved from Vienna to Linz in early 1932, was contacted, and he provided the following information reported in an official annotation: In May 1931 Franz von Hoeffft resigned as chairman and was succeeded by the vice-chairman Dr. Roland Klumak. The secretary Guido von Pirquet had already resigned at the beginning of 1929.⁷ The society had only a few remaining members in spring 1931, and the work came to an end.

Dr. Klumak was asked for a statement, and he asked for the official liquidation of the society, which was implemented by the authority in February 1933. Klumak was also the head of the Vienna Urania Observatory from 1922 to 1933.⁸

Guido von Pirquet, as far as he could remember, wrote in March 1960 about the foundation of the society:

In autumn 1926 my attention was called to the rocket committee by engineer Fuchs at the Urania Observatory, who has in those days from time to time substituted the head Dr. Klumak in the explaining talks . . . The mentioned committee met from time to time in the flat of Dr. Franz von Hoefft, Darwingasse 34, who was living there with his mother . . . At a special discussion, which took place at Professor Wolf's Institute at the University of Technology, there were present: a general (for ballistics), the name has slipped my memory, but I remember that he had a particular idea for the manufacture of special alloys . . . and he was in contact with the arsenal; the chemist Dr. Körner; the radiologist Professor Dr. Kirsch; the geophysicist Professor Wagner; Dr. Franz Hoefft; Dipl.-Ing. Guido Pirquet and another unidentified person . . . At this meeting Professor Wolf wrote a series of coherent formulas at the blackboard, which were perfectly correct—though without consideration of the stage principle.

He stated as the results of his investigations: a) one will reach the height of 54 km (which was the maximum of the distant gun to Paris) b) the exhaust velocity can not go beyond the molecular velocity of the starting temperature, which is in figures 1500 to 2000 m/s.

Dr. von Hoefft raised some theoretical objections (he had studied physical chemistry with Professor Nernst)—whereas I replied “the projectile of the distant gun must have had already a starting velocity of 1600 m/s . . .”

The consequence was, that the remaining committee did not participate anymore on the work and meetings, whereas Hoefft registered the foundation of a society, where Hoefft was nominated chairman and I was nominated secretary . . .

This society got the name “Austrian Society for Space Research.”⁹

Professor Karl Wolf (1886–1950) was appointed professor of mechanics at the Vienna University of Technology (Technische Hochschule Wien) in 1924 with the theory of elasticity being his favorite field of research.¹⁰ The “geophysicist Prof. Wagner” is most probably identified as Professor Dr. Arthur Wagner (1883–1942). He was “Observer First Class” at the “Central Institute for Meteorology and Geodynamics,” Vienna, and was appointed professor for cosmic physics at the University of Innsbruck in May 1927. His special interest included the meteorology of high altitudes.¹¹ The mentioned “radiologist Professor Dr. Kirsch” is most probably identical with the physicist Professor Dr. Gerhard Kirsch (1890–1956), although not a “radiologist,” but his main field of interest

was the physics of radioactivity.¹² The “chemist Dr. Körner” could not be identified.

The only public statement found of the above mentioned circle, except Franz von Hoefft and Guido von Pirquet, was made by Wolf in a newspaper article in November 1927 as an answer to two newspaper articles published at the end of October 1927.¹³ The first article makes reference to “news from many newspapers . . . that on November 13, 1926 the newly founded “Society for Space Research” held its first meeting in Vienna.” But it also stated that “work on the realization of plans, which are in any respect utopian, must be called bad for morals, since it means waste of human efforts and means for the impossible and worthless.” In his reply von Hoefft argues from the scientific and technological viewpoint and states that the arguments by Czelechowski cannot be taken seriously by any expert in the field. Wolf, after some remarks that only rocket propulsion opens the possibility to move in space vacuum, concluded that at the present technological and scientific state of the art it was absolutely impossible to leave the planet. He would only see the possibility to reach an altitude of about 40 to 50 km, but he would also regard the first successful space flight as a milestone in the history of humankind.

One of the main aims of the society stated in a one-page advertisement to the public was: “Our first aim is the realisation of the sounding rocket, which will open up for scientific research up to now inaccessible heights of the atmosphere, the region of northern lights and shooting stars (between 30 and 100, up to 200 km). This will simultaneously form the experimental basis for further rocket development.”¹⁴

The society participated, in the beginning of 1928, at the “Viennese aviation exhibition 1928” (Wiener Luftfahrt-Ausstellung 1928) with its own booth. A newspaper mentioned: “The Society for High Altitude Exploration, to wide sections known through its support for the plans of Dr. Hoefft of a rocket trip through space, also had the opportunity to call the attention to its aims and goals.”¹⁵ But the society never got to work properly to realize the large-scale experiments needed.¹⁶

Erich Dolezal (1902–1990)

Erich Dolezal was born in 1902 in Villach in the province of Carinthia but soon moved to Vienna with his family. In 1920 he started to study mechanical engineering at the Vienna University of Technology and soon turned to a career as a writer of newspaper articles about astronomical subjects and as a national educator in adult educational programs. He came in contact with space travel re-

lated material in the mid 1920s and was among the first to give public talks and lectures on the subject in Austria. One of his first newspaper articles about space travel was published in mid 1927 and explained in detail the plans of von Hoefft's rocket development program, supported by artistically enhanced pictures of models.¹⁷



Figure 1: Erich Dolezal (1902–1990).

In 1928 Dolezal published his first science fiction novel, but it was not until 1930, when the novel was adapted for a radio play, that it got more publicity.¹⁸ In the same year he took a job at the Austrian broadcasting corporation, RAVAG, working in the section for science coverage.

After World War II Dolezal was one of the founders, and for many years editor in chief, of the only Austrian popular science and technology journal, *Universum*. Additionally, he worked as a lecturer in adult evening classes. In 1949 Dolezal was a cofounder of the Austrian Society for Space Research. In 1953 he started to write science fiction novels for youth and published about a dozen books during the next 20 years. In 1959 he was invited by the U.S. State Department to visit astronomical observatories and rocket launching sites. In honor of his merits for national education, he was awarded the honorary title “Professor” by the Austrian president in 1963. Dolezal, in his later years, was consultant of the Austrian Broadcasting Corporation in Vienna.¹⁹ He died in 1990. In 1995 an asteroid was named in memory of him: (5884) Dolezal.²⁰

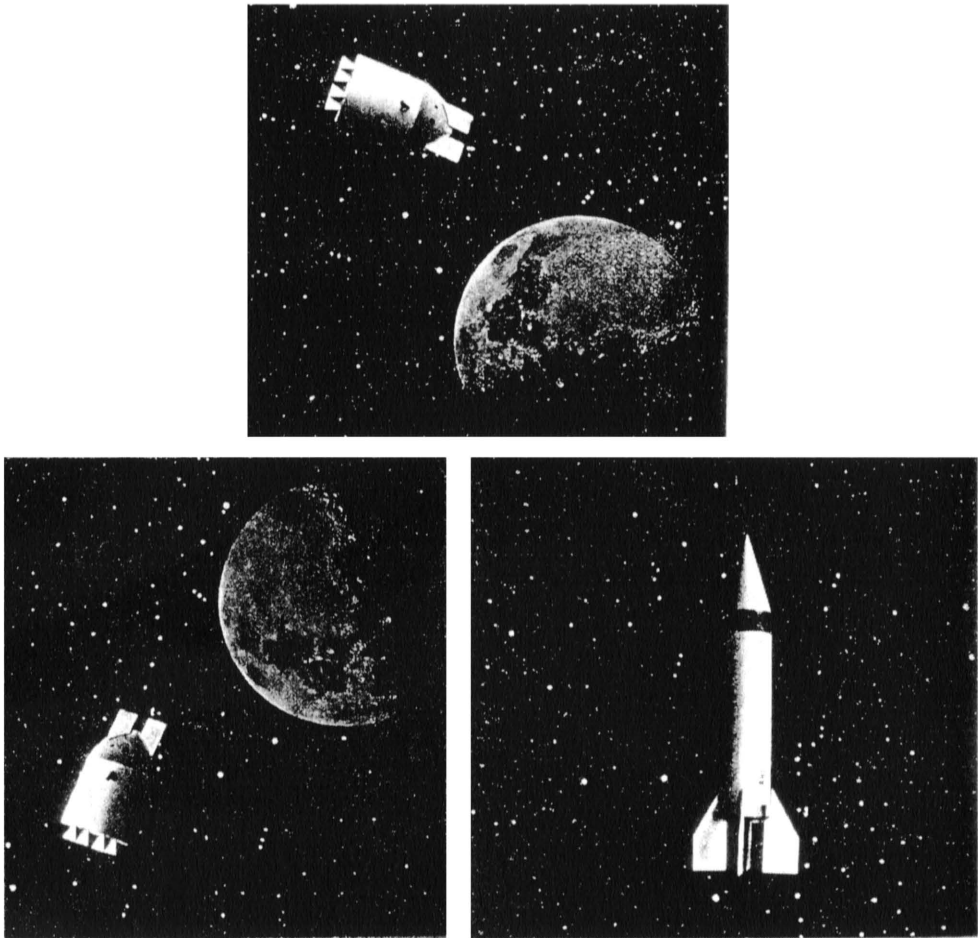


Figure 2: Franz von Hoefft's rocket development program.²¹

In spring 1928 Dolezal wrote an article about the state of space travel, reporting that the Society for High Altitude Exploration was present at the Viennese Spring Trade Fair, within the aviation exhibition. He also talked about the plans for a test model of a nozzle for an oxyhydrogen rocket motor that would be examined soon at the Vienna University of Technology. He mentioned the Exhibition on "Interplanetary Communication" in Moscow and the establishment of an astronomical commission within the "French Astronomical Federation."²²

In a newspaper article published in 1931, Dolezal summarized the work of Robert Goddard, Hermann Oberth, and Darwin O. Lyon and also, in the last section, described the use of rockets in case of war.²³ In an article for a youth journal in 1933, he described in detail the advantages and applicability of solid-fuel

rockets for hail weather and signal rocketry. He also reported on rocket tests performed on a special design by Rudolf Zwerina.²⁴



Pyrotechnische
SIGNAL-Artikel
für die **Flug-Sicherung**

Leucht-, Signal- und Rauch-Raketen
für Tag- und Nacht-Verkehr

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neuester patentierter Konstruktion mit unerreichter Steig- und
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Sirius A. G., vorm. Hermann Weiffenbach.
Wien 11/3, Weiffenbachstraße 180

Telephon R-45-3-99Telegr.-Adr.: Pyrosirius

Figure 3: Advertisement for weather rockets. Flug (Wien), 1933 (04), April, p. 16.



Figure 4: Launch and explosion of a hail weather rocket.

Rudolf Zwerina (1895–?)

Rudolf Zwerina was born in 1895 in Brünn (later Brno) and studied mechanical engineering from 1913 to 1916 at the Vienna University of Technology. After working at an aircraft factory during World War I, he returned to the university and graduated in summer 1920. Between 1922 and 1927 he was an assistant at the institute of airship travel and automobile technology (Luftschiffahrt und Automobiltechnik) at the Vienna University of Technology.²⁵ For the time period after 1927 no more biographical details could be found.

In 1931–32 Zwerina published a review about possible new areas of applications for rockets, mentioning his many years of research on solid-fuel rockets. He entered into details of signal, ship rescue, meteorological sounding, aircraft auxiliary, and hail weather rockets.²⁶

In 1932 he described in more detail the usability of solid-fuel rockets for hail weather and storm prevention on the grounds of theoretical and practical considerations.²⁷ In December 1932 a local newspaper announced that complementary to a talk titled “The Modern Rocket,” to be given by Erich Dolezal, there would be a demonstration of different rocket types by Rudolf Zwerina.²⁸

Rudolf Zwerina, sometimes together with his financial backer Hermann Stolfa or alone, applied for several patents for his designs of solid-fuel rockets at the Austrian Patent Office and got some of them granted. The main innovation was named the so-called “chamber rocket,” which had cavities in the propellant to ensure an almost constant burn of the propellant.²⁹



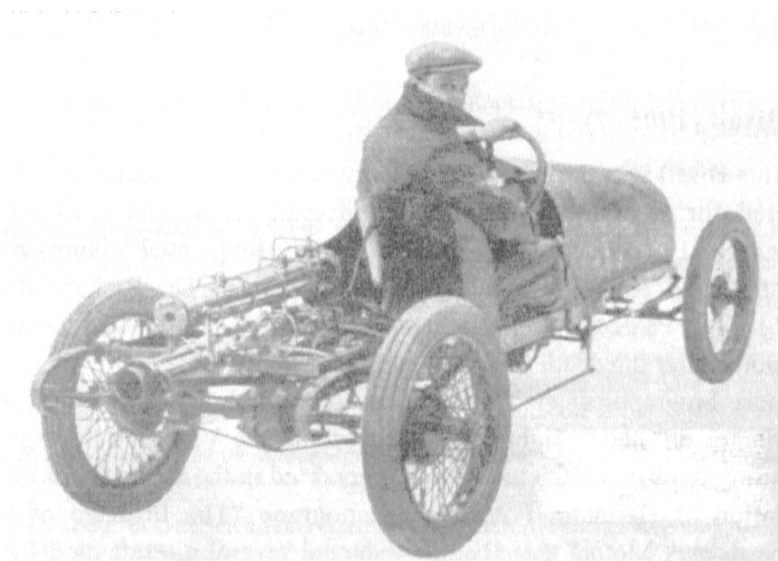
Die „Kaltetenmänner“:
Baurat Ing. H. Stolfa, Ing. R. Zwerina, E. Dolezal.

Figure 5: The “Rocket Men” Stolfa, Zwerina, and Dolezal.

Other Individuals

Karl Cerny

No biographical details could be found about Karl Cerny. Rather limited information about his project is available. A newspaper announced in February 1933 that in the provincial town of St. Pölten, Lower Austria, a 25-year-old mechanic, Karl Cerny, was working hard on the design of a liquid-fuel rocket propulsion system and that in two weeks, probably at the trotting race course Krieau in Vienna, he would demonstrate his rocket car.³⁰ A photo of the actual rocket car was published in *Astronautics* of May 1941.³¹



Wien 1933, Karl Cerny am Lenkrad seines Raketenwagens.

Figure 6: Cerny at the steering wheel of his rocket car.³²

Hans Thirring (1888–1976)

Thirring, born in 1888, studied theoretical physics at the University of Vienna, and in 1911 he finished his doctoral thesis. Already in 1915 he received the “*Venia Legendi*” to teach at the university. After serving in the Austro–Hungarian Army during World War I, in 1921 he was appointed professor and head of the Institute of Theoretical Physics at the University of Vienna. He was the successor to such eminent scientists as Ludwig Boltzmann and Friedrich Hasenöhl. Thirring was not only a gifted theoretical physicist but also a talented inventor, and he held about 40 patents.³³

In the academic year 1933–34, a series of five lectures about “old problems–new solutions in the exact sciences” was given at the Vienna Physical Institute and published afterward in a booklet. One of the lectures was devoted to the question: “Can we fly into space?”³⁴ Thirring stated in the introduction that there was no principle making it impossible to fly into space, but at the current state of the technological art one could not think about a realization of such flights. His argument for why this problem only played a superficial role in academic lectures and scientific publications was that physics and technology have to solve more urgent and immediate problems.

In his work he cited Eugen Sänger’s book, *Rocket Flight*, as being one of only a few serious books on the subject. He finished his discussion with the sentence: “However, the present-day generation will not live to see the flight into space.”

Aurelius Bisail (1905–?)

Aurelius Bisail was born in 1905 in Görz (later Gorizia and Nova Gorica) and registered for studying mechanical engineering at Vienna University of Technology from 1922–23 to 1928–29.³⁵ He mainly frequented lectures on airship navigation and automobile technology of Professor Dr. Richard Knoller (1869–1926)³⁶ and Professor Ing. Richard Katzmayer (1884–1945),³⁷ who took over the lectures after the death of Prof. Knoller.

No more biographical details could be found, although Bisail was a frequent contributor on model flight-related subjects to the Viennese flight journal *Der Flug* during the years 1929 to 1931. It is reported in the appendix of the Slovene translation of Hermann Potočnik’s monograph “The Problem of Space Travel—The Rocket Motor” that Bisail conducted several aircraft model rocket flights in Vienna at the end of May, mid June, and mid July 1928.³⁸ No confirmation by other sources could be made.

Acknowledgements

The author would like to thank Elfriede Sykora, Prof. Dr. Willibald Riedler, and Prof. Dr. Wolfgang Baumjohann for their continual interest and support of my research activities. Dr. Zoltan Vörös is thanked for reading earlier versions and suggesting improvements. Sincere thanks go to Mr. Alois Hartl, Library of Vienna University of Technology, for his assistance and patience with my often out-of-hand getting literature searches. The study was financially supported by a grant from “Stiftung der Ersten Österreichischen Sparkasse” of the Austrian

Academy of Sciences, and the presentation at the IAC was partially supported by a travel grant of the “Amt der Steier-märkischen Landesregierung, Abteilung 3—Wissenschaft und Forschung, GZ: A3-12 B 44-01/3.” I would also like to thank Dipl.-Ing. Dr. Alfred Lechner and Dr. Juliane Mikoletzky, Archive of Vienna University of Technology; Dr. Rudolf Jerabek, Austrian National Archive, Vienna; and Mag. Brigitte Kromp and Hofrat Mag. Dr. Wolfgang Kerber, Austrian Central Library of Physics, Vienna; for their help in locating certain documents and making them available for study.

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