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Chapter 7

Astronautics in Germany: The Post-War Years 1948–1953*

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Abstract

Astronautics in Germany began when Hermann Oberth published his famous books in 1923 and 1928. Motivated by these and other publications, the first private Space Society (VfR) was formed in 1927, operated the first rocket test field in Berlin, and lasted through 1934. In the same year the German Army took over all rocket-related activities. The second attempt to start a private society in 1936 (Gesellschaft fuer Weltraumforschung or GfW) was short lived due to World War II. This society was revived, however, in 1948 at Frankfurt, Stuttgart, and Stade. The Stuttgart branch became the leading group. In summer 1949 it passed a resolution proposing an International Astronautical Congress (IAC), which was organized by the French in Paris in autumn 1950. This led one year later to the foundation of the International Astronautical Federation (IAF) at the second IAC at London in autumn 1951. The constitution and bylaws were approved at the 3rd Congress at Stuttgart. In this article, the milestones of the 1948–53 activities of the GfW are listed; working groups that had been estab-

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lished conducting several research projects are mentioned, and the growth of the society during the first six years of its existence is summarized.

Historical Background

The beginning of astronautical activities in Germany was the publication of Hermann Oberth's *Die Rakete zu den Planetenraeumen* (*Rockets to the Planets*) by the Oldenbourg publishers at Munich in 1923. It opened the scientific discussion of the possibility of space travel in Germany. Several other books by W. Hohmann, M. Valier, W. Ley, O. W. Gail, and other authors complemented Oberth's book, giving this subject a lot of publicity. This led to the first formal public space organization, the "Verein fuer Raumschiffahrt e.V." (Society for Space Travel). It was founded on 5 July 1927 at Breslau by J. Winkler, who designed and conducted experiments with liquid rockets. This society published a small journal *Die Rakete* (*The Rocket*) from 1927 to 1929. The history of this society was skillfully documented by Willy Ley. In 1933–34 the German Army took over all rocket-related activities, and little room was left for non-military activities with rocket experiments. The privately operated (by GfW) Raketenflugplatz Berlin Reinickendorf (Rocket Airfield), managed by Rudolf Nebel, was closed due to lack of funds. It wasn't until August 1937 before a group of astronomy students under H. K. Kaiser surfaced in Breslau and founded the first "Gesellschaft fuer Weltraumforschung e.V." This society published the journal *Weltraum* in the years 1939–43, with some interruptions due to the war. The membership rose to about 400, but the end of World War II stopped all activities of this group. Its last president was Krafft A. Ehricke.

The rocket development before and during World War II in Germany was well documented by W. Dornberger, a leading figure of this activity, and others. In 1935 the German Air Force also got into the act by supporting studies on a global rocket airplane and a rocket engine development center at Trauen, headed by Eugen Saenger. Many industrial companies participated in these developments, such as BMW, Siemens, Telefunken, Heinkel, Walter, and many others. Thus several thousand scientists, engineers, and technicians became acquainted with rocket technology, and some were also infected with the virus of astronautics. Several hundred of them were able to continue working in the field in the United States, Soviet Union, France, and Great Britain, but not all voluntarily. Most of them remained in Germany and started a new career in different fields.

A New Beginning after World War II

Hardly three years after the war, a few young enthusiasts raised their voices in favor of astronautics and looked for possible ways to start activities toward spaceflight again. This was not easy, as Germany was split into four sectors occupied by the Allies. These, of course, were suspicious and did not permit any activities in rocketry. Even the words “rocket” and “spaceflight” were not allowed to be used before 1948. Thus, the people interested in the subject promoted a working group for “space research” at the local observatory at Stuttgart. H. H. Koelle, a student at the Technical University of Stuttgart, initiated this group formally in a meeting on 28 January 1948 in Stuttgart. Fifty-one members, mostly students, joined the group the same day and prepared an application to incorporate the new “Gesellschaft fuer Weltraumforschung e.V. (GfW).” This was granted on 5 August 1948 and a legal basis existed from then on to discuss spaceflight in the open again and initiate respective studies.

A board of directors was chosen, headed by J. Gerhards (a former assistant of H. Oberth), and H. H. Koelle (a former pilot). A consulting committee of eminent scientists was elected, headed by astronomer Prof. Dr. Siedentopf. Prof. Oberth became the honorary president. The work centered on two activities: building up membership and activating working groups on selected subjects.

Some limited encouragement was obtained by the German Ministry of Transportation (Dr. Ing. Seebohm) and industrial companies (Daimler-Benz), that signed up as corporate members. Dr. F. Gerlach of the Ministry of Transportation was a great help to round up supporters in official circles and industry. H. Gartmann, a former BMW rocket engineer turned science writer, was effective to organize the publicity activities of the new society. He wrote several books on this subject.

At a summer meeting of the GfW in August 1949, the membership passed a resolution, prepared by H. Gartmann and H. H. Koelle, calling for international cooperation of all private rocket and astronautical societies and proposing an international space congress. The British Interplanetary Society (BIS) and a few other groups responded positively. A. Ananoff, president of the astronautics section of the French Aeroclub, offered to organize an international congress in Paris in the fall of 1950. Thus the IAC was born, leading to the foundation of the IAF at the second IAC at London in 1951 and passing the constitution and by-laws at Stuttgart in 1952 during the third IAC.

In 1952, 1–8 September, the German GfW was host of the 3rd International Astronautical Congress. This was a welcome opportunity to make the society, its aims, and its activities public through the media. The Congress was

opened by the German Minister of Transportation, Dr. H. C. Seebohm. This was the first time that a cabinet member of a national government showed interest in the astronautical movement. Sixteen societies from twelve countries with more than 300 people participated in this historic event. A rocket and spaceflight exhibition, the largest to that date, was presented during this Congress and was open to the public. About 16,000 visitors were counted—a great success at that time! The material of this exhibition was used in other exhibitions quite often in other cities in the years to follow. The 25 papers presented during the Congress were published in the *Proceedings*, a mimeographed volume of 256 pages.

The GfW was represented regularly by large delegations at the following international congresses. The average number of German delegates was about 30; six to eight papers were presented. The chief delegates at the Paris and London Congresses were Dr. G. Loeser and H. H. Koelle; at the Stuttgart and Zurich Congresses were Prof. Dr. Schuette and Dr. F. Gerlach. The first president of IAF, Dr. E. Saenger, and the first vice president Dr. G. Loeser, were members of the GfW. The GfW formed local sections at Hamburg, Frankfurt, Nuremberg, Munich, Düsseldorf, Hannover, and Berlin in the years 1950 through 1952. These groups had public meetings with lectures, and in some local groups even made space-related experiments. Technical working groups of the GfW were formed, beginning in 1950. The first was on the subject of “communications,” headed by Dr. R. Merten. This group arranged for a special conference and published the papers presented as a book, titled *Hochfrequenztechnik und Weltraumfahrt (High Frequency and Space Travel)*. The second group performed conceptual designs of rockets (H. H. Koelle, H. Hoepfner). Several multistage rockets were analyzed and conceptual designs were produced. The efforts concentrated on three rocket launchers for low Earth orbit missions (two-hour orbit) with characteristics summarized in Table 2. Other active groups were the following:

- Rocket engine design (H. H. Koelle)
- Celestial mechanics (H. G. L. Krause)
- Rocket ballistics (H. G. L. Krause, M. Kuebler)
- Nuclear propulsion (H. J. Kaeppler, B. Heim)
- Rocket history (A. Fritz, M. Benndorf)

Aside from the GfW activities at Stuttgart, there were also attempts in other areas of Germany to form groups of interested people promoting rocketry and astronautics. One working group for spaceflight was formed in Berlin at the Archenhold Observatory by E. Maedlow in 1946, being active only for a few years. In March 1948, J. W. Goethe founded a Swd GfW (Southwestern GfW) at Frankfurt, which never got off to meaningful activities. In August 1948, N. Litterst and H. O. Ruppe tried to form a group at Leipzig in East Germany (DDR).

They merged with some enthusiasts at Lucka in the “Vereinigte Astronautische Arbeits-gemeinschaften” (Unified Astronautical Working Group). They managed to publish a mimeographed journal called *Ad Astra*. The 10th issue of December 1950 was the last, and then the group was dissolved by higher authority. H. K. Kaiser founded at the same time the Nwd GfW (Northwestern GfW) at Stade, which published several research reports in the years 1950–52. It became a non-voting IAF member in 1951, but merged with the GfW Stuttgart in 1952.

Also in 1952 A. Puellenberg founded the “Deutsche Gesellschaft fuer Raketenforschung” (German Society for Rocket Research), which planned to do experimental work with small rockets, however, it was without great success. A few years later F. Staats picked up the remnants of this group and renamed it “Hermann Oberth Gesellschaft e.V.”, which became a nonvoting member of the IAF several years later.

The GfW was the leading force behind two daughter institutions that were founded at Stuttgart: the “Deutsches Raketen- und Raumfahrtmuseum e.V.,” founded in 1952 and managed by A. Fritz, and the “Forschungsinstitut fuer Strahlantriebe” (FPS) (Research Institute for the Physics of Jet Propulsion e.V.), in 1954. The “German Rocket and Space Museum e.V.” presented its material at exhibitions at Stuttgart, Karlsruhe, Braunschweig, Copenhagen, Nuremberg, Reutlingen, Balingen, Düsseldorf, and Munich, particularly during the years 1952 and 1953. The floor space was between 300 and 3,000 square meters. The number of visitors was more than 300,000. Unfortunately, the museum was not successful to establish itself at a permanent place. Most of the historical material collected ended up at the Deutsches Museum at Munich.

A research institute was always the prime goal of the GfW. It was difficult to find the resources required to pay a professional staff, even a small one. The GfW, however, finally succeeded to get the support of the federal and state government, in addition to some industrial enterprises. Finally, in July 1954, the Institute (FPS) was officially founded, the budget for the first year was 140,000 DM. Dr. Eugen Saenger was appointed director of the institute, and the first staff members began their work in August 1954 in offices located at the Stuttgart airport. The institute was later integrated in the Federal Research Establishment. A space systems institute at the University of Stuttgart is continuing today the tradition of the early space efforts of the GfW and FPS.

The milestones of the evolving astronautical movement in post-war Germany are summarized in Table 1.

The later years have been summarized in a final report after the merger of the German Aeronautics Society and the Astronautic Society in 1968 [Ref. 15].

Table 1: Milestones of the early postwar space activities in Germany

- 29 January 1948: Meeting at Stuttgart and formal founding of the postwar “Gesellschaft fuer Weltraumforschung e.V.” by H. H. Koelle
- 5 August 1948: Incorporation of the society providing a legal basis
- 27 January 1949: Prof. Hermann Oberth appointed honorary president; H. Gartmann is elected technical director
- 26 June 1949: During its summer session, the GfW passes a resolution proposing an International Astronautical Congress and sends it to all known rocket and spaceflight societies
- June 1949: H. K. Kaiser forms the Nwd. CfW at Stade
- 1 December 1949: Foundation of the “Hermann Oberth Medal” by CfW
- 26 January 1950: First issue of the journal *Weltraumfahrt* published
- August 1950: Prof. W. Schaub is elected chair of the board of directors
- July 1952: Prof. K. Schuette follows Prof. W. Schaub as chair
- 1–6 September 1952: Third International Congress at Stuttgart
- 30 September 1952: The Nwd. Gesellschaft fuer Weltraumforschung merges with the GfW Stuttgart
- November 1952: The German Rocket and Space Museum is founded
- July 1954: The Research Institute for Physics of Jet Propulsion is founded.

Table 2: Launch vehicle concepts studied by the GfW in the 1951–53 period.

Designation	GfW-2b-	GfW-1jL-	GfW-1jP-
Payload	Scientific payload	Cargo delivery	Passenger transport
Number of stages	3	4	4
Take-off thrust (kg)	117,838	1,572,656	1,572,656
s.l. exhaust velocity (m/sec)	2,531	2,553	2,553
Characteristic velocity (m/sec)	8,533	9,333	9,353
Total effective mass ratio	22.5	27.5	27.7
Payload weight (kg)	300	7,235	5,636
Growth factor	300	163	272
Net growth factor	43.6	19.6	33.1
Diameter (m)	3.00	9.00	9.00
Height (m)	21.5	49.00	49.00
Wingspan (m)	—	—	22.0

Table 3: Selected statistics of the “Gesellschaft fuer Weltraumforschung” (GfW) activities in the years 1948–1953

GfW Statistics	1948	1949	1950	1951	1952	1953
Number of members	131	245	363	437	590	751
Growth rate (percent)	—	87	48	20	35	27
Number of lectures	17	27	87	104	99	68
Total audience	830	812	7,025	10,040	7,323	5,000
Total income (DM)	1,727	1,684	3,926	7,578	38,648	13,826
Research reports—including Nwd. GfW	—	—	1	10	4	2

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