Some remarks on the early history of the Albert Einstein Institute.
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1 Introduction

After the re-unification of Germany in 1990, reorganizations on all levels of scientific activity took place, mainly in the former German Democratic Republic (GDR). The universities there and the institutions for research were adapted to the existing structures in West Germany by planning “unsophisticated and conservative imitations of western institutions” as the then chairman of the German “Science Council” critically wrote ([1], p. 23). As a first step, the Science Council initiated an evaluation of universities and research institutes of GDR in June 1991 under the chairmanship of H. Gabriel, Berlin. The early consultation of the Ministers for Research and Science of the five new States, representing the former GDR, with the president of Max Planck Society, Hans F. Zacher (1928-2015), in Munich from 9 to 10 December 1990 shows, that from the beginning the Max Planck Society was a prominent one among many players ([2]. Part I, p. 371). Its aim was to reach the same influence in the new States of the East as it already had in the West.

In GDR, research on relativistic theories of gravitation had been carried through both at universities like the University of Jena and in institutions of the Academy of Science of GDR like the Zentralinstitut für Astrophysik (ZIAP) which incorporated astrophysical institutes and astronomical observatories - among them the Einstein-Laboratory. As I spent a sabbatical in winter 1990/91 at the Technical University Berlin, I had contact with both, groups in West-Berlin and at ZIAP, where I met Dr. H.-H. von Borzeskowski of the Einstein-Laboratory in Potsdam-Babelsberg in November and attended a meeting there on 8 December 1990. On 17 January 1991 I gave a lecture at ZIAP; a meeting with Prof. D.-E. Liebscher (Einstein-Laboratory) occured on 6 February 1991. Such activities must be seen in
connection with preparations for the memorandum with F. Hehl to be introduced below. The chairman of the German Astronomical Society at the time, Wolfgang Hillebrandt, also visited ZIAP on 4 February 1991 in order to be able to give a recommendation on its future. He simultaneously was a scientific member of the Max Planck Institute (MPI) for Physics and Astrophysics in Munich. According to him: “Of course, the question was raised whether, and if yes, in what way Max Planck Society and its institutes would be able to help”. But for financial reasons: “[..] in the end, we could offer our colleagues at ZIAP only our moral support [..]” ([3], p. 135).

In April 1991, another initiative came to life: the “Arbeitsstelle Albert Einstein in Berlin”[5]. It may be seen as one of the precursors of the Max Planck Institute for the History of Science, founded in 1994, which absorbed a philosopher, originally belonging to Treder’s Einstein-Laboratory.

In July 1991, the German Council of Science recommended that the Zentralinstitut für Astrophysik, and particularly, H.-J. Treder’s Einstein-Laboratory for Theoretical Physics in Potsdam, both of which were involved in research on general relativity, should be discontinued: “In its present size and constitution, the Einstein-Laboratory does not offer the conditions for a sufficiently broad contribution to the complex problems of gravitational theory, modern cosmology and the unification of general relativity with quantum theory [..].”([6], p. 86.)

Somewhat earlier, on 8 March 1991, the Max Planck-Institute (MPI) for Physics and Astrophysics in Munich had been split up into three independent institutions, the MPI for Physics in Munich, the MPI for Astrophysics and the MPI for extraterrestrial Physics both in Garching with the last two originally established as subdivisions already in 1963. The working group “gravitational theory” under its director Jürgen Ehlers (1929-2008) installed in 1971 continued within the MPI for Astrophysics. Ehlers had an internationally recognized scientific stature and strove to control the field in Germany. As we will see below, astrophysics in GDR became directly related to the foundation of a new Max Planck Institute for gravitation.[3]

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1This reference was pointed out to me by G. Schäfer, Jena
2This was a research project of J. Renn at the Max Planck Institute for Human Development under its director Wolfgang Edelstein, financed by the Senate of Berlin for 5 years.
3I must rely mostly on documents privately held, because the retention period for the
2 Preludes to the foundation of the Albert Einstein Institute

2.1 Suggestion of an International Einstein Center

On 8 February, 1991, four months after the German “reunification” and prior to the recommendation of the Council of Science mentioned above, Friedrich Hehl, Cologne and Hubert Goenner, Göttingen, formulated a Memorandum pleading for the foundation of an International Einstein Center in Potsdam/Caputh. After a description of the historical situation, and the low importance given to research on general relativity in Germany - with two leading scientists nearing retirement - it was stated there:

“[..] Quite certainly, no ‘relativist’ will be appointed to the full professorships mentioned above after retirement of the present incumbents. As seen from the international standard of competition in a fundamental branch of modern physics, for junior researchers this situation is, consequently, rather discouraging in terms of job openings etc. A closing down of the Einstein-Laboratory, without substitution, would appear irresponsible under such circumstances. [..] In summing up, we suggest the creation of the International Einstein Center (ICE) in which theoretical physics research in the field of relativity and gravitation in relationship with elementary particle physics is cultivated.”

Special emphasis was put on the international character of ICE, in the sense that not just one country alone should become involved in the foundation. Also Einstein’s summer home in Caputh, in GDR belonging to the Einstein-Laboratory, was included in this plan to hold up Einstein’s heritage in Germany. The summer home now is administered by the “Einstein Forum” established in 1993 by the State of Brandenburg with the participation of

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intervall 1990 to 1995 in the archive of Max Planck Society is still valid. Nevertheless, I could look at a few documents which strengthened and complemented my point of view.

Had we known about the complicated problems with ownership concerning Einstein’s summer house arising only later, we certainly would have abstained from such a consideration.
This memorandum was submitted to the secretary of the German Council of Science and Humanities (Wissenschaftsrat) on 11 February 1991 and later announced in “Physikalische Blätter”, a journal related to German Physical Society [8]. In it, the hope was expressed that German junior relativists would finally find a secure opportunity for pursuing their research. Also, the Minister of Science of the new state of Brandenburg, Hinrich Enderlein was informed and expressed his interest by earmarking an amount in the budget for this purpose [9]. Yet, a blocking notice was marked for the case of “Third party conception and trusteeship” [10]. The then German Minister for Research and Technology, Heinz Riesenhuber, also was approached. Although open-minded with regard to our suggestion, he wanted to wait for a decision by the Council of Science [11]. I also sent a copy of the memorandum to our colleague Jürgen Ehlers at the MPI for Physics and Astrophysics, Munich on 28 February 1991 whom I had orally informed already during a previous encounter at a F.E.S.T-seminar in Heidelberg.

2.2 A possible cooperation between Germany and Israel?

Originally, our intention was to establish a joint German-Israeli research institute and to ask the German-Israeli Foundation for Scientific Research & Development (GIF) to take part besides the German Federal Ministry for Research & Technology and the State of Brandenburg. The plan won the approval of the well-known Israeli theoretical physicist Yuval Ne’eman (1925-2006) [12], at the time Minister for Science as well as Minister for Energy and Infrastructure. This explains why in the committee of trustees we suggested, two theoretical physicists from Israel appeared: Y. Ne’eman (Tel-Aviv) and N. Rosen (Haifa). In addition, H. Fritzsch (Munich), Abdus Salam (Trieste/London), E. Schmutzer (Jena), and J.A. Wheeler (Princeton) were named. J. A. Wheeler, due to his inability “to estimate the political factors from this distance, and due to existing heavy commitments” did not want to

\[5\text{Y. Ne’eman co-discovered SU(3)-symmetry in particle physics. He was president of Tel Aviv University (1971-1975) and founder of the Israel Space Agency in 1983.}\]
become a trustee. Also, the board of GIF communicated “with regret” that, due to its bylaws GIF could not permanently support such an Einstein Center. As it turned out, the State of Israel was interested neither in a German nor in an international Institute, but only in an eventual establishment of two Einstein Centers, one in Jerusalem, the other in Germany, possibly under the auspices of the MINERVA foundation. However, as Israel was short of the money needed, there was no hope in its involvement. As a way out for such a case, in the memorandum by Hehl and Goenner a possible engagement of “UNESCO and other organizations” had been mentioned. Perhaps, we were overly optimistic: this unconventional suggestion was not taken up by any of the relevant organizations in Germany. At the time of re-unification, politics including science policy, strove to arrange the incorporation of the former GDR with the minimal number of new ideas.

Further international support for our initiative came from a number of well-known colleagues like Einstein’s former assistant P. G. Bergmann, Syracuse, B. Bertotti, Pavia, and Allan Held, Bern, editor of the journal of relativity and gravitation. P. Bergmann and V. de Sabbata, Bologna, started an initiative of their own for the maintenance of Treder’s Einstein-Laboratory as well as Wolfgang Edelstein and Peter Damerow (1939-2011) from the MPI for Human Development.

2.3 How the Max Planck Society took over

Fully aware of our initiative and of the missing institutional background in terms of funds and positions on the side of the initiators, in July 1991

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\[6\] It is unclear whether Wheeler referred to an eventual political involvement of H.-J. Treder (1928-2006), a doctoral student of A. Papapetrou (1907-1997). Treder was member of the communist party in West Berlin and later had good relations to members of the central committee of the ruling party in GDR (SED). However, he was not politically active himself.

\[7\] In 1964, the Minerva Foundation was established as a subsidiary of the Max Planck Society; ever since then it is financed by the German Federal Ministry for Education and Research.

\[8\] Copies of the letters by GIF also went to the Federal Minister Riesenhuber.

\[9\] To give another example: all attempts for working out a constitution for re-united Germany replacing the temporary “Grundgesetz” were stalled by the ruling political parties.
the German Council of Science and Humanities suggested the foundation of an Albert-Einstein-Institute for Gravitational Physics in the region Berlin-Potsdam:

“Institutions from abroad with corresponding competences should take part in the foundation. The Council of Science asks the Max Planck Society to take over the lead management for the appointment of a working group which makes suggestions for a possible organizing institution and an adequate infrastructure.” ([6], p. 88.)

At this point, in 1991, MaxPlanck Society was still far from assuming the trusteeship for the suggested institute. In fact, according to its president Hans Zacher: “[..] this commission merely will address the task to build a scientific conception for the suggested [by the Council of Science] Institute for Gravitational Physics. The Memorandum resulting from these deliberations will be the basis for the State of Brandenburg to appoint the actual founding commission for the suggested institute [..]” ([7].

This way of proceeding was supported by the then president of German Physical Society (DPG), Th. Mayer-Kuckuk (1927-2014) [19]. To him and to the president of Max Planck Society, F. W. Hehl and H. Goenner then expressed their full support for an initiative in this direction by the Max Planck Society, and also their wish to take part in a preparatory group [20], [21]. The Fachverband Gravitation and Relativity through its chairman, G. Schäfer, did not support our memorandum but instead the recommendation of the German Council of Science which had included essential elements of the memorandum by Hehl & Goenner. H. Schäfer at the time belonged to the group of J. Ehlers [16]. The suggested working group was not set up by the State of Brandenburg as claimed by Zacher, but due to a letter by the Brandenburg minister that he should take it in his hands, H. Zacher delegated it to J. Ehlers who became its chairman; it included the acting director of the MPI for Astrophysics, W. Hillebrandt, and three expert colleagues from universities in Jena, Paris and Zürich. To the German physics community, in particular to the Fachverband Gravitation and Relativity, neither the members of this group nor its proceedings were communicated. For discussions concerning the funding of the new institute, Ehlers met with people from the ministry in Brandenburg at the end of October 1991. The financial means to be contributed by the State of Brandenburg were insufficient. A report from
Ehlers envisaged at first for the end of 1991 and then for the time after a meeting of his preparatory group in January 1992 did not materialize for the public although it was ready since the end of 1991. The internal discussions in the Max Planck Society have been lengthy and less than unanimous. During the summer of 1992 a rumor, triggered by the retirement of the director of the MPI for Astrophysics in Munich, R. Kippenhahn, came up that this institute which also housed the gravitational group directed by J. Ehlers, might become closed down [22]. In fact, four alternatives were discussed within Max Planck Society: (1) to join the MPI for Astrophysics to the MPI for Extraterrestrial Physics; (2) to distribute the activities of the Max Planck Society in the field of Astrophysics among the existing institutes in Heidelberg, Bonn and Garching; (3) an amalgamation with ZIAP or part of it (suggested by G. Haerendel of the MPI for Extraterrestrial Physics), and (4) the maintaining the institute as it existed [23]. In his remarks concerning the foundation of the Max Planck Institute for Gravitational Physics, W. Hillebrandt reports a suggestion, told him by H. Zacher that the MPI for Astrophysics should be merged with theoretical groups of ZIAP and moved to Potsdam, and that he refused to concur ([3], p. 135). Perhaps, this was the expression of a trend of the time, i.e., to reduce funds for science in the West of BRD in favour of new structures in the East: “In the landscape of research, buildup of the East by cutback in the West cannot always be excluded.”

At the meeting of Max Planck Society on 8 March 1991, it was also decided that, as a first measure, G. Neugebauer of the University Jena should be asked by H. Zacher to establish in Jena one of the 27 working groups supported by the Society in 1991 and 1992 for a duration of five years. Its begin was set to 1 January 1992 ([2], part I, p. 375) [11]. In the tradition of Max Planck Society, Neugebauer, in principle, was free to choose the three other members. His partner institute was the MPI for Astrophysics in Garching. The suggestion for this group in Jena had come from J. Ehlers and on his recommendation Gerhard Schäfer from the group in Garching joined Neugebauer’s group as the fourth member in March 1992.

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10 “Aufbau Ost durch Abbau West kann auch in der Forschungslandschaft nicht immer ausgeschlossen werden”
11 The original decision for the establishment of such working groups and the code of practice dates from 5 November 1990 ([2], part I, p. 370).
It was not before 19 July 1993 that the “Memorandum on the founding of an Albert Einstein Institute für Gravitationsphysik” finally was issued by the Working Group set up by J. Ehlers and distributed by him\textsuperscript{12}. The memorandum emphasized:

“What is missing is an institute where researchers from Germany and abroad can collaborate for reasonable periods of time. An Einstein Institute could serve this purpose and thus stimulate also both research and teaching at universities. Universities cannot play this role: Positions are not available, high-level teaching requires a minimal number of people with small teaching obligations working in close contact with each other and with guests from abroad. [...] The research should mainly concentrate on basic physics not on astrophysical phenomenology.”

Thus, similar to what had been formulated during the 3rd Hochschulreform of GDR in 1968 \textsuperscript{25}, the intention was to clearly distribute tasks between low-level teaching at universities and research-oriented high-level teaching in close cooperation with Max Planck Institutes. It is surprising that the university professors on the “Working Group” supported such a formulation: They were \textit{obliged} to teach but knew that teaching was \textit{voluntary} for members of a Max Planck Institute. In addition, the memorandum accepted the lack of positions for relativity research in Germany as unalterable. “It may be necessary to obtain leading scientists from abroad to direct such an institute.”\textsuperscript{13} In the memorandum, it was made very clear that only “the trusteeship of Max Planck Society” could secure the plan:

“The committee feels that the optimal solution, and perhaps the only one which would guarantee that a “center of excellence” with a long-time perspective could actually be formed, would be that the Max-Planck-Gesellschaft founds such an institute, to be named Max-Planck-Institut für Gravitationsphysik (Einstein-Institut). [...] In accordance with this memorandum, the committee recommends that Jürgen Ehlers apply for the founding of a Max-Planck-Institut für Gravitationsphysik.”

\textsuperscript{12}He had written the memorandum and its support was secured through a circulation procedure.

\textsuperscript{13}As it turned out later, from Germany only junior scientists belonging to Ehler’s group inside the Max Planck Society would obtain permanent positions in the new institute.

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Unlike what had been intended by the memorandum of Hehl and Goenner and by the statement of the German Council of Science, the new institute would rest on a purely national basis but with an international personnel. This was an early expression of the present policy of Max Planck Society:

“Against the background of the high degree of internationalization of MaxPlanck Society - as seen on an international scale, and of the resulting high scientific performance capacity, [..] Max Planck Society further continuously boosts the process of internationalization.” [20]

Together with its memorandum, Ehlers sent around invitations for comments from representatives of the international and German community of relativists on the occasion of an announced “Symposium on Developments and Trends in Gravitational Physics” to be held on Sept. 20-21, 1993 in Munich. During the symposium, besides the scientific lectures [14], the eventual structure of the planned institute was discussed (types and number of positions) as well as possible candidates for directorship. Max Planck Society had followed the recommendation by introducing a second “Scientific Organization Committee” with G. Wegner, MPI for Polymer Research as its chairman and 6 other directors of Max Planck Institutes plus 3 university professors as members. J. Ehlers and H. Walther, MPI for Quantum Optics, at the time vice-president of Max Planck Society were present as guests.

In view of its past difficulties with Max Planck Society, the MPI for Astrophysics might not have been unhappy to lose Ehler’s department. At the time, it seems not to have played a big role in the institute: in the three yearly reports from 1991 to 1993, no topic from Ehler’s group is noted among the key activities of the MPI for Astrophysics in Garching [15] (27, p. 303-313, [28], p. 311-319, [29], p. 349-359).

On 9 June 1994, during its meeting in Göttingen, the Max Planck Society finally decided to establish an Institute for Gravitational Physics “in the region of Potsdam” with J. Ehlers, a scientific member of Max Planck Society,

\[14\] Of the thirteen scientific talks, only three were given by speakers from the German relativity community.

\[15\] This is somewhat surprising because during these years Ehlers’ group and his guests contributed 20% of all publications from the MPI for Astrophysics. Cf. [31].
as one of the envisaged three directors\textsuperscript{16} (\cite{1}, part I, p. 416). 16 permanent positions and the same number for visiting scientists were planned. In its yearly report for 1994, very fittingly, now the MPI for Astrophysics in Garching highlighted Ehler’s group under “Global dynamics of self-gravitating matter” (\cite{30} p. 343-346).

3 Opening and growth of the institute

Almost one year later, the new Max Planck Institute for Gravitational Physics (“Albert Einstein Institute”) opened in Potsdam on 1 April 1995. (\cite{2}, p. 426). The original spin doctors for the foundation of such an institute, i.e., F. W. Hehl and H. Goenner, were not invited\textsuperscript{17}. The institute began with two departments headed by J. Ehlers (“Physical Foundations and mathematical methods of general relativity”) and Bernard F. Schutz (“Gravitational theories oriented toward observations”) who began to work in his position in June 1995. The third department directed by Hermann Nicolai, Hamburg, started on 1 March 1997. Originally, it had been planned as a working area for “Relativity- and quantum theory” (\cite{32}, p. 423). At the end of 1998, J. Ehlers already retired: he had been director for only 3 and a half years, an exceptional situation for a newly created Max Planck Institute. Since 1999, the Albert Einstein Institute has moved to its new building in Golm near Potsdam.

Unfortunately, by its construction the structure of the Albert Einstein Institute showed that general relativity was considered as an appendix to either astrophysics and elementary particle physics, or to mathematics. The institute established a leading international role in research: now, it seems to be the largest institute in the world for research on relativistic gravitation. While countless guests from abroad were welcomed on German taxpayers’ money, the job-situation in Germany for relativists was not improved by the Albert Einstein Institute (AEI). Together with the University of Potsdam, programs leading to a PhD were offered. The steady number of about 14 PhDs produced per decade at German universities in the field of general rel-

\textsuperscript{16}Bernhard F. Schutz from the University of Cardiff was also considered as a possible director.

\textsuperscript{17}This is in conformity with the present formulation of the institute’s history: “Its establishment was an initiative of its founding director, Jürgen Ehlers (1929-2008)” \cite{33}.
ativity, cosmology and relativistic astrophysics during the three decades from the 1960s to the 1980s, in the first years after 1995 remained uninfluenced by the new Max Planck Institute for Gravitational Physics. This situation has changed dramatically, however. At present the AEI in Golm trains 19 PhD students, i.e., probably more in the field of gravitation than any German university does.

In 2002, to the Albert Einstein Institute a fourth section on experimental gravitation in Hannover (measurement of gravitational waves by interferometry, data analysis) with its director Karsten Danzmann has been added. In 2007 Bruce Allen became a further director concerned with gravitational waves. The institute is rooted both in the MPI for Quantum Optics, Munich, where the first interferometers were built, and in the Institute for Atom and Molecule Physics (AMP) of the University of Hannover.\[18\] It runs the detector GEO 600 for gravitational waves with arms of 600 meter, together with the universities of Glasgow and Cardiff. The institute has contributed importantly to the recent great success of the direct observation of a gravitational wave by the LIGO-group in the United States. At present, AEI-Hannover has attracted 44 PhD students.

### 4 Conclusion

How has the landscape for research on general relativity and other relativistic theories of gravitation changed since the opening of the Max Planck Institute for Gravitational Physics? The most important new feature is that research in gravitation in Germany now has a fixed point - independent of the appointment of full professors at universities, more or less at haphazard with regard to a rational policy of keeping research on gravitation going. The total number of PhD-students at the MPI for Gravitational Physics seems to show that, at present, at this single institution more PhDs are trained on gravitational topics than by professors in all German universities together. The situation is more complicated, however. On the one hand, the subjects of research at the Max Planck Institute for Gravitational Physics in Golm - outside the “Astrophysical and Cosmological Relativity Division” - have broadened to the extent that only a small part of these PhDs will be in general relativity proper and quantum gravity. And on the other hand, the great

\[18\] Since 1 January 1994 the MPI for Quantum Optics had a branch office in Hannover.
The majority of the PhD students are coming from abroad - very much in the spirit of the cultural politics of the Ministry of Foreign Affairs. One wonders how this situation will continue if less and less professorships connected to research in relativistic theories of gravitation at German universities are filled. The trend seems to go toward applied gravitational research in astrophysics and astronomy.19

The genesis of the Max Planck Institute for Gravitational Physics as described here, hopefully, shows that the history of the founding of the institute is not as simplistic as claimed: that it came to life because J. Ehlers had the idea and realized his “lifetime dream of a Max Planck Institute for Gravitational Physics”20 ([3], p. 137). In contrast, it is an example for the observation that scientists: “[..] are strategists, choosing the most opportune moment, engaging in potentially fruitful collaborations, evaluating and grasping opportunities, and rushing to credited information. Their political ability is invested in the heart of doing science.” ([34], p. 213). A condensed formulation is given by Kohler for whom scientists: “build careers by occupying a number of strategic positions on an incessantly changing market” ([35], p. 166).

5 Acknowledgment

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19By the creation of graduate schools and graduate colleges including the words “gravitation” or “cosmology” in their title nothing more than the financing of doctoral degrees is reorganized.

20It looks rather that someone with good relations to president H. Zacher had “jumped the band waggon” and then worked hard and succeeded to direct the “waggon” to where he wanted it to go.
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