

Besides, the city of Prague is wonderful, that beautiful that this city alone would already prove of value for a longer journey."

Albert Einstein, 1911

## ALBERT EINSTEIN'S YEARS IN PRAGUE, 1911-1912

### Preface

Einstein's years in Prague are an important milestone in the life of this important researcher and philosopher. In Prague Albert Einstein found – according to his own writings – the necessary composure to give the basic thought of the general theory of relativity (1908) a more definite shape.

### Alma mater Carolina Pragensis

After Bologna and the Sorbonne in Paris, Prague as the third city had an university on the European mainland. Its founder Karl IV, emperor of the Holy Roman Empire, and its first director, archbishop and university chancellor Arnost von Pardubice gave the Prague College glory and fame. The university town at the Moldau had always strongly attracted scientists and artists. The royal astronomer, scholar and God seeker Tycho Brahe worked in Prague. Here his assistant and successor [Johannes Kepler](#) wrote his *Astronomia nova*. Here worked together with Kepler the royal clock maker, mathematician, instrument maker and inventor of the logarithms, Joost Bürgi. This Swiss researcher had worked out his "Progress Tables" in Prague many years before Neper's logarithm tables. Also the director Medikus Jan Jessenius worked here, furthermore the astronomer and mathematician Jan Marck Marci and the philosopher and theologian Bernhard Bolzano. Apart from many other people the physicist Christian Doppler did his teaching profession here.

### Einstein's work before the years in Prague

In 1908 Einstein began his teaching profession as private lecturer at the University of Bern and worked from 1909 as teacher for theoretical physics at the University of Zurich. At the University in Prague the situation was complicated. The professor for theoretical physics, Hofrat (honorary title conferred on a senior civil servant) Ferdinand Lippich, said goodbye an retired, so the chair for this subject was free. The commission for faculty – the mathematician Georg Pick and second dean Anton Lampa from the philosophical faculty – recommended three candidates to the Vienna ministry of culture for this chair. The first one was Dr Einstein, "secundo loco" professor Gustav Jaumann from the Technical College and university teacher Emil Kohl from Vienna. The choice later on was clearly in favour of Albert Einstein. Administrative negotiations followed. Einstein's Swiss nationality shouldn't become an obstacle but his confession did. In Zurich Einstein was "undenominational". For the imperial and royal ceremony and the etiquette this wasn't acceptable at all. An undenominational man couldn't swear a real oath of allegiance. Einstein declared himself on the reception form as "mosaic". Emperor Franz Joseph I of Austria had permitted the chair for Albert Einstein with validity from April 1 in 1911 on January 6 in 1911. At the same time the Institute for Theoretical Physics was opened by a minister decree and Albert Einstein was entrusted with the management of it.



Prague

### **Professor Albert Einstein in Prague**

Einstein as full university professor for theoretical physics at the German University in Prague had to plead for the Austrian nationality of the back then monarchy. As professor he had to get the stipulated gala uniform (black coat with golden ribbons, tricorn and rapier). "Here Einstein's humour was put to the test", writes Johannes Wickert in his Einstein monograph.

### **The Einstein family in Prague**

The hundred-towered university town at the Moldau had much to offer to Einstein. The Hradschin Panorama with the Karlsbruecke, the Kleinseitner Palaces, the old town centre with the town hall and the Altstaedter Ring. And the antique Jew city with its three synagogues at the place of the very old ghetto. Apart from that there were four colleges in Prague, namely two universities and two technical colleges, separated by nationalities. Albert Einstein (31) came to Prague with his family: with his wife [Mileva](#) (36) and with his two sons [Hans Albert](#) (7) and [Eduard](#) (1). A new flat was built for them in the Prague district Smichow. They lived in Lesnicka Gasse 7 at the left bank of the Moldau. The Einsteins had, as it was normal these days, a maid. The move from Zurich to Prague bore many difficulties and Mileva had much sorrow. For the people of Prague Einstein was a German with a strong self-confidence. Half of the Jews in Prague spoke German back then. But Mileva was born Serbian. She had great difficulty in adapting. Mileva didn't like the stay in Prague as much as she had hoped. Furthermore there were ever greater arguments in the marriage.

### **Einstein in the Jewish community of Prague**

Einstein had been a personality in society for his whole life. He loved the social contacts with his vicinity not only as student in Aarau and Zurich or as civil servant in Bern but also as professor in Prague. Einstein payed special attention to the philosophical-literary debating circle in the salon Bertha Fanta on the Prague Altstaedter Ring. Especially here before the Altstaedter Ring in the pharmacy "Zum Einhorn" not only the Jewish Jeunesse dorée but also the musical and literary society from the Jewish old town centre met. The famous participants here were the writers Max Brod, Franz Kafka, the philosopher and active Zionist Hugo Bergmann and the physicist Philipp Frank, the later successor to Einstein in Prague. All of them were passionate musicians and debaters. Einstein was welcome in this salon and took part in the literary discussions and musical events. Einstein liked it very much to be with the Winternitz family in the old town centre of Prague. Professor Moritz Winternitz was a specialist for archaeology and an expert in Sanskrit and old Indian literature. The different preferences of the two scientists were no hindrance, neither for the exchange of opinions nor for the round-table-debates. Einstein liked coming here

with his violin because the cousin of Professor Winternitz was a music teacher. Apart from these social relations Einstein was totally absorbed by the deep insights in the physical nature of room, time, mass and gravitation.

### **Einstein's teaching profession in Prague**

Shortly after assuming office at the University in Prague (April 1911) professor Einstein held lectures in the summer semester three times a week – on Monday, Wednesday and Friday from 9 to 10 a.m. about mechanics and on Tuesday and Thursday at the same time he dealt with selected chapters of the kinetic heat theory. In addition he also led the two-hour lasting seminars in the Institute for Theoretical Physics in the Vinicna (Weinberger) Gasse. On the whole professor Einstein had about six regular male and female students. Apart from the lectures at the university he held lectures for the broader Prague society. The run into the auditorium of the faculty was immense.

### **Einstein's scientific work in Prague**

The 17-month lasting stay in Prague was extraordinarily successful. Here Einstein wrote 11 scientific works, 5 of them on radiation mathematics and on quantum theory of the solids. In March 1916 in the Leipzig "Annalen der Physik" the work "The Foundation of the General Theory of Relativity" was published and in December of the same year Einstein published his famous book "On the Special and General Theory of Relativity". This book was later translated also into the Czech language. Albert Einstein wrote a special preface to this edition.

#### So let Einstein speak himself:

"I'm pleased that this little book in which the main thoughts of the theory of relativity are portrayed is now published in the national language of the country in which I found the necessary composure to give the basic thought of the general theory of relativity (1908) step by step a more definite shape so it could be realized. In the quiet rooms of the Theoretical Physical Institute of the Prague German University in the Vinicna ulice I discovered in 1911 that the equivalence principle demands a refraction of the rays of light at the sun of a sum that can be observed without knowing that more than a hundred years before a similar conclusion out of the Newton mechanic in connection with Newton's emission theory of the light was drawn. Also the still not really confirmed consequence of the red shift of the spectral lines I discovered in Prague."

In another work of Prague "On the Influence of Gravitation on the Propagation of Light" Einstein drew the attention to the diffraction of the ray near the sun. For Einstein the visit of the physicist Paul Ehrenfest from Petersburg counted to the most beautiful moments of the stay in Prague. Apart from the passionate exchange of thoughts they also made music together.

### **The Solvay Congress of the physicists in Brussels, October 1911**

The Belgian industrial and chemist Ernst Solvay had called for an international scientific congress in Brussels. President of this "summit conference" was the Dutch Nobel laureate Hendrik A. Lorentz. From Britain came Rutherford and Jeans, from Paris Poincaré, Marie Curie, Louis Broglie and Paul Langevin. From Germany came [Nernst](#), Planck, Sommerfeld and others. Einstein and Hasenöhrle were on the list of participants from Austria. For the Conseil Solvay Einstein wrote the work referendum "On the Current State of the Problem of Specific Heat". At this congress Einstein could make influential acquaintance.

### **Saying goodbye to Prague**

In the middle of the year 1912 Einstein quit his teaching profession at the German University of Prague. This resignation was officially permitted by emperor Franz Joseph I. Einstein received a nomination as full professor to the Swiss Technical College (ETH) in Zurich. The whole family, especially Mileva, was pleased about the return to Switzerland. The move from Prague to Zurich was on July 25 in 1912. Soon afterwards, namely at the end of 1913, the great scholar was elected to be full member of the Prussian Academy of Sciences in Berlin. Albert Einstein worked in Berlin from 1914 to 1932 and spent his last years in Princeton (USA).