



Albert Einstein in Prague

Alena Šolcová

Dept. of Applied Mathematics

Faculty of Information Technology

Czech Technical University

in Prague

alena.solcova@fit.cvut.cz



Albert Einstein



- Einstein as a Phenomenon
- Einstein and Mathematics
- Einstein and Tradition in Prague



Einstein

Chief Engineer of the Universe



Einstein and Prague

- Prague is only one of more cities where the most famous physicist **Albert Einstein** (1879 – 1955) worked.
- In 1911 – 1912 he was **the professor of theoretical physics at German University in Prague**. His short stay there was very fruitful.



Necessary concentration of AE

- In his own words he found in Prague

«the necessary concentration for giving a more precise form to the basic idea of the general theory of relativity».



16 months in Prague

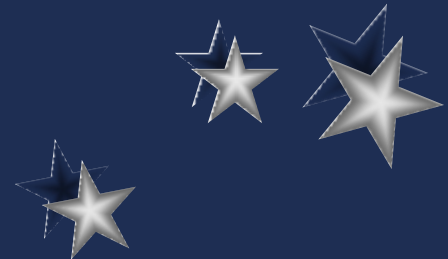
- During this time he lived **with a family at No. 7, Lesnická Street in Smíchov** near Vltava river from 15th April 1911.
- Holding the position of professor of theoretical physics he read **lectures in the Clementinum** (sooner a Jesuit College in baroque style), and in the **Physical Institute of the German University in Prague**, in **Viničná Street** (today Faculty of Natural Sciences, Charles University).



AE as teacher

- Lectures from:
 - mechanics,
 - thermomechanics,
 - continuum mechanics ...

during Sommer semester 1911,
and Winter semester 1911/12



AE – Scientific Activity

His stay in Prague was filled with significant creative activity.

He published **eleven papers!** during this time:

- on the theory of relativity and gravity,
- on thermodynamics,
- radiation theory,
- quantum physics,
- first steps to theory of gravitational lenses.



Contacts with colleagues

- Discussions with colleagues (Professors of both universities in Prague: the mathematician **Georg Pick** or linguist **Winternitz**, astronomer **Wáclaw W. Heinrich** etc.)
- He continued often during walking around the river, in the **Kinski Garden** or in **Café Louvre** in today's National Street, in **Montmartre**, and other restaurants.



Einstein and Mathematics

Georg Pick, mathematician

10th August 1859 Wien

26th July 1942

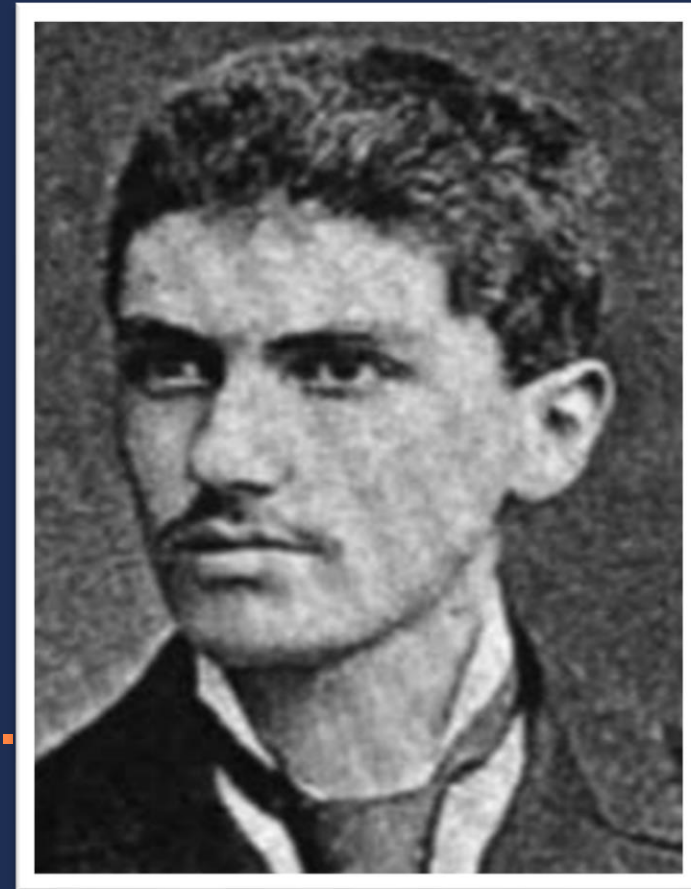
Theresienstadt

Famous Pick Theorem

He motivated AE to study of Riemann geometry, Ricci and Lévi-Civita's differential geometry.

Then AE continued in studies of math related to relativity with

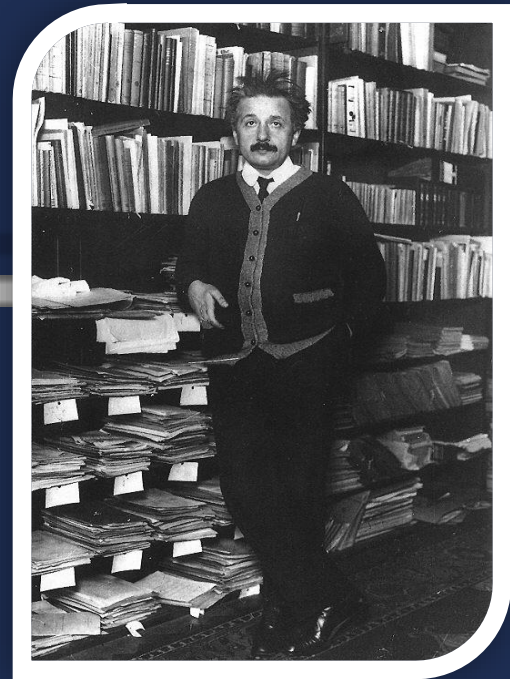
Marcel Grossmann in Zürich.



Second visit of Prague

Gerhard Kowalewski,
professor of mathematics,
German University in Prague
remembers:

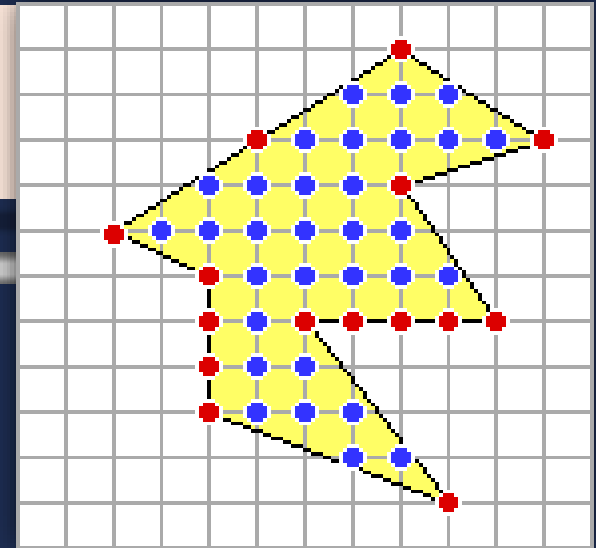
Einstein's General Relativity Lecture in 1921:
LOTOS, German Society of Scientists



*Talk was very simple, it seems to him that
“general relativity is very easy understandable.”*



Pick's Theorem



- $P(x) = I + B/2 - 1$, where
 I is the number of net points of (x)
inside
 B is the number of boarder points of (x)
- The author of the Pick's Theorem is
is the Austrian mahematician, the professor of
German University in Prague
Georg Alexander Pick (1859-1942).
„Geometrisches zur Zahlenlehre“
Sitzungber. Lotos, Naturwissen Zeitschrift
Prague, 19 (1899), 311-319.



Proofs of Pick's Theorem

W. W. Funkenbusch

“From Euler's Formula to Pick's Formula using an Edge Theorem”

The American Mathematical Monthly

Volume 81 (1974) pages 647-648 Dale E. Varberg

“Pick's Theorem Revisited”

The American Mathematical Monthly

Volume 92 (1985) pages 584-587

Branko Grünbaum and G. C. Shephard

“Pick's Theorem”

The American Mathematical Monthly

Volume 100 (1993) pages 150-161 Alexander Bogomolny

“Cut-the-Knot” web site

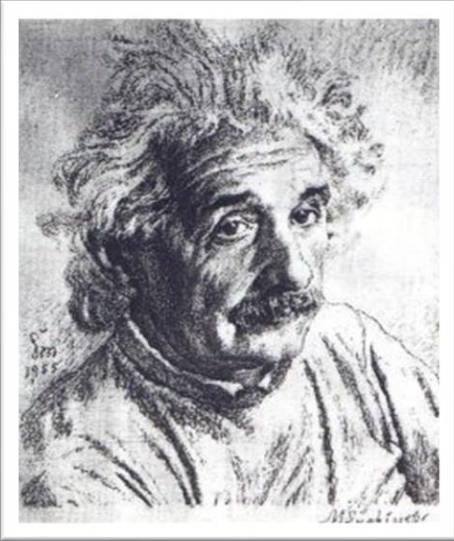
A Proof of Pick's Theorem

http://www.cut-the-knot-org.ck/Pick_proof.shtml



Tradition in Prague

Memorial tablets



- Viničná Str. 7, New Town, 1956
- Lesnická Str. 7, Smíchov, 1979
- Old Town Square No. 17, Old Town, 1999

- Summerhouse Portheimka in barock style
- Restaurants: Louvre, Montmartre



Contacts with Jewish society

- He often visited the **Berta Fanta's salon** at **No. 17 Old Town Square**, where he took part in philosophical discussions and played violin.
- **Franz Kafka** and **Max Brod** were other visitors of this salon.
- In 1999 (during celebration of 120th Einstein's birthday) we constructed new memorial tablet there.



Old Town Square No. 17



Symbols:

- $E = Mc^2$
- Violin
- Old Town Tower
- Charles Bridge
- curved trajectory of light close to Sun



Literature and Sources

- Frank, Phillip: *Einstein. His Life and Times*, New York, A. Knopf, 1947
- Bičák, J., ed.: *Einstein a Praha*, JČMF Praha 1979
- Šolcová, A. , Křížek, M.: *Čas plyne, jméno zůstává*, PMFA, 1998



AE in Poetry

*The destiny of all the world is hidden
In the system of equations written
At a small piece of paper.*

*There is also the resolution of my fate there:
I am going not to be here
One hundred years later.*

**Author : Emil Calda – patomathematician
and our excellent teacher of mathematics**



Ivan Puluĵ – Plaque in Presslova Str.



Number of memorials: JK, AE

- It is quite unusual for a scientist to have three memorial plaques in one city.
- As far as Prague is concerned, this honour has been paid only two personalities: **Johannes Kepler** and **Albert Einstein** (minor planet *2001 Einstein*) who arrived in Prague more than three centuries later. A bronze memorial plaque to his honour can be found at Staroměstské náměstí (The Old Town Square) No. 17/551.



Old Town Square No. 17

- It is a profile of the famous physicist in relief. Above and under it there are inscriptions in Czech and English.
- The English version reads:
“Here, in the Salon of Mrs. Berta Fanta, Albert Einstein, professor at Prague University in 1911 to 1912, founder of the theory of relativity, Nobel Prize winner, played the violin and met his friends, famous writers Max Brod and Franz Kafka.”



Next plaque and bust of AE

- Einstein also worked and gave lectures at the Institute of Physics of the German University, at the building which now houses the Faculty of Natural Sciences of Charles University at Viničná Street No. 7 (Prague 2).

A plaque with Einstein's portrait in relief and his biographical data has been placed in the entrance hall.

- A bronze memorial bust of Einstein can be found on the house at Lesnická Street No. 7, Prague 5 – Smíchov - where Einstein lived in years 1911–1912.

