

Welcome to the  
20<sup>th</sup> International Workshop on Laser  
Ranging 2016 in Potsdam

October 10 - 14, 2016

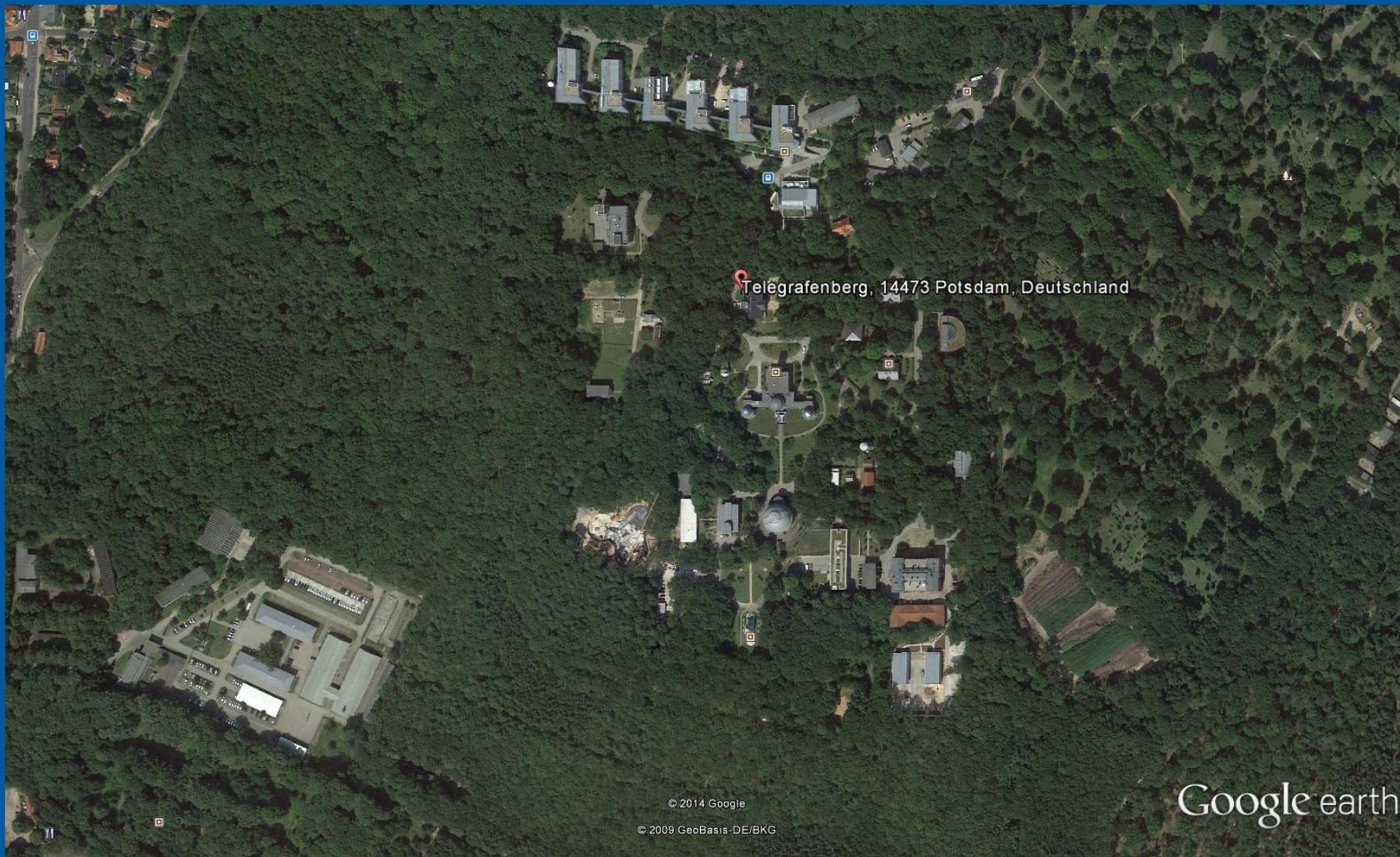
German Research Centre for Geosciences  
Potsdam, Telegrafenberg ("Telegraph Hill")



Wissenschaftspark Albert Einstein  
Telegrafenberg Potsdam

- Helmholtz-Zentrum Potsdam - Deutsches GeoForschungszentrum GFZ
- Alfred-Wegener-Institut für Polar- und Meeresforschung (AWI)
- Potsdam-Institut für Klimafolgenforschung (PIK)
- Leibniz-Institut für Astrophysik Potsdam (AIP)
- Deutscher Wetterdienst (DWD)
- Nutzergemeinschaft des Wissenschaftsparks





Telegrafenberg, 14473 Potsdam, Deutschland

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**GFZ**

Helmholtz-Zentrum  
**POTSDAM**

 **HELMHOLTZ**  
GEMEINSCHAFT

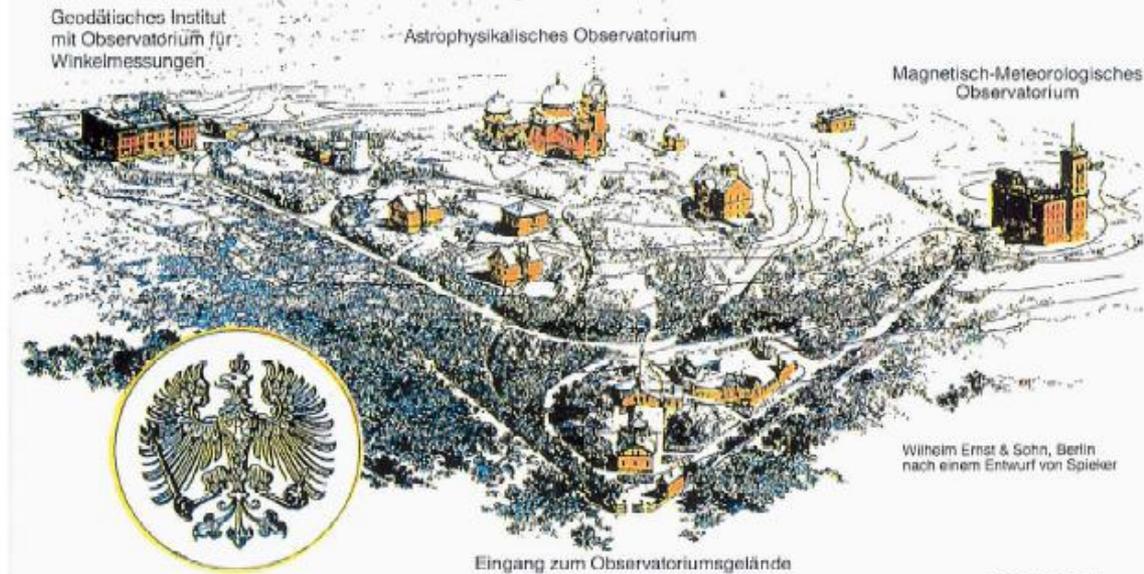
# Royal Prussian Optical Telegraph Line 1832 - 1849





- 6 indicators in 3 levels = 4096 different combinations !
  - First attempts of „time transfer“

*Die Königlich Preussischen Observatorien bei Potsdam  
auf dem Telegraphen-Berge (um 1892)*

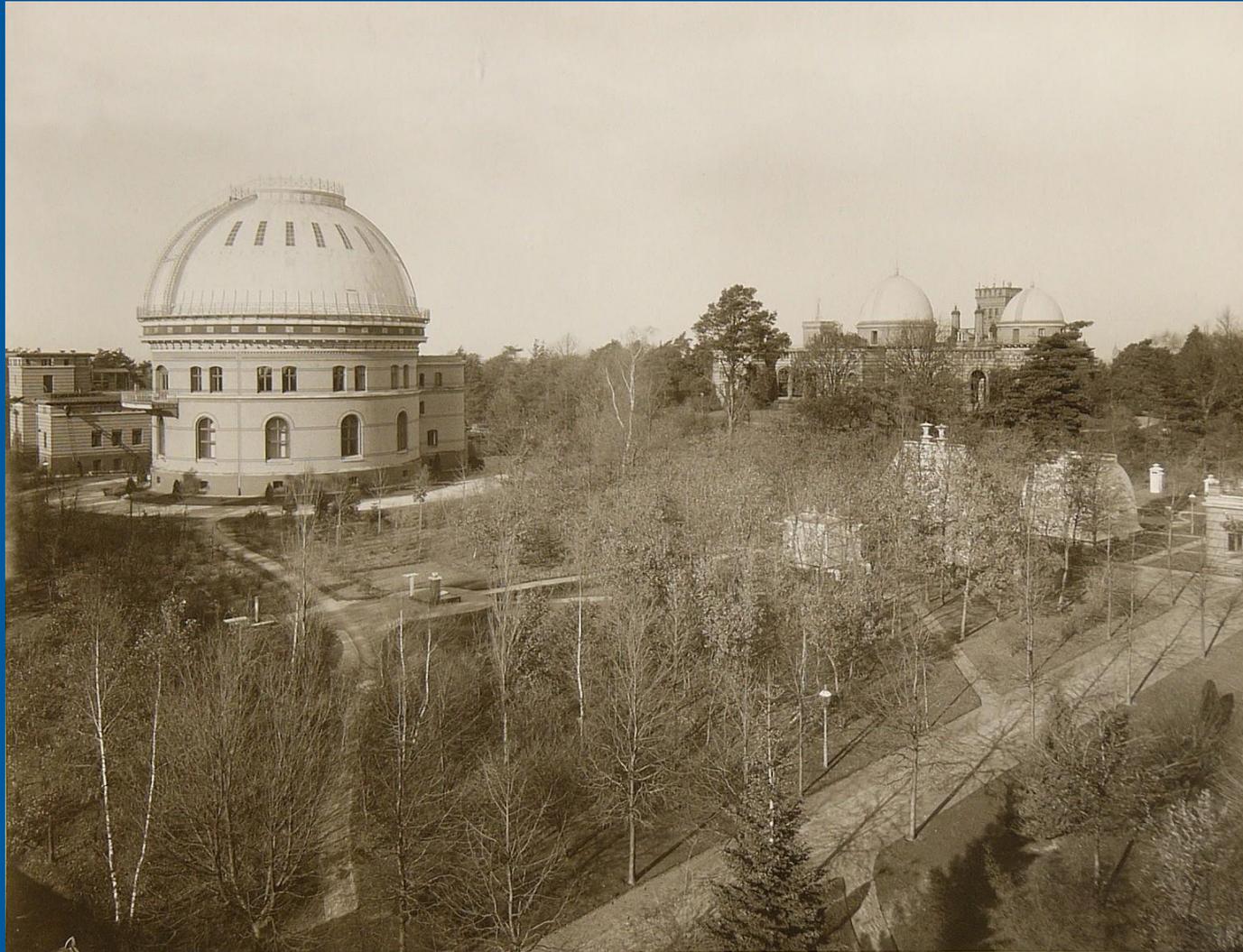


**GFZ**  
POTSDAM

Since 1875: unique ensemble of scientific buildings

- Astrophysical Observatory (1876-1879)
- Geomagnetic – meteorological Observatory (1888 – 1889)
- Geodetic Institute (1892-1895)

# Telegrafenberg: view about 1899



# Telegrafenberg Potsdam – today's view



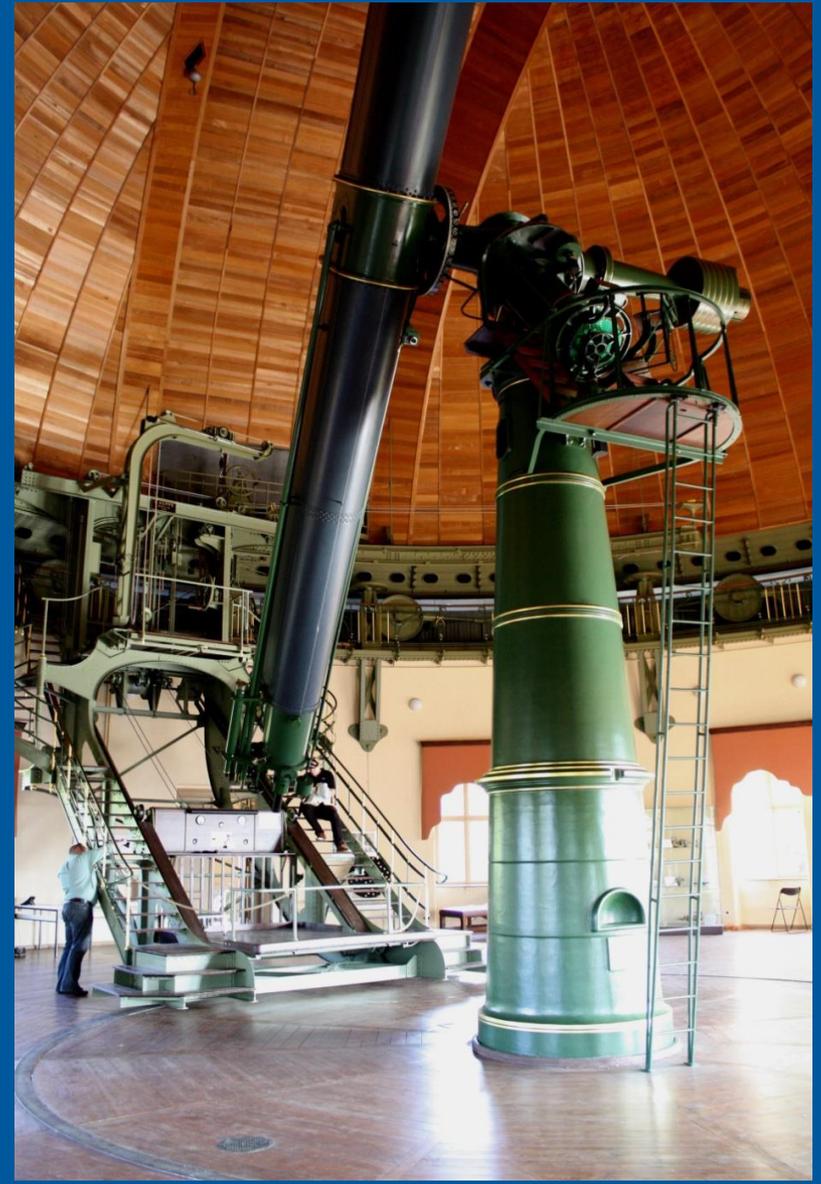
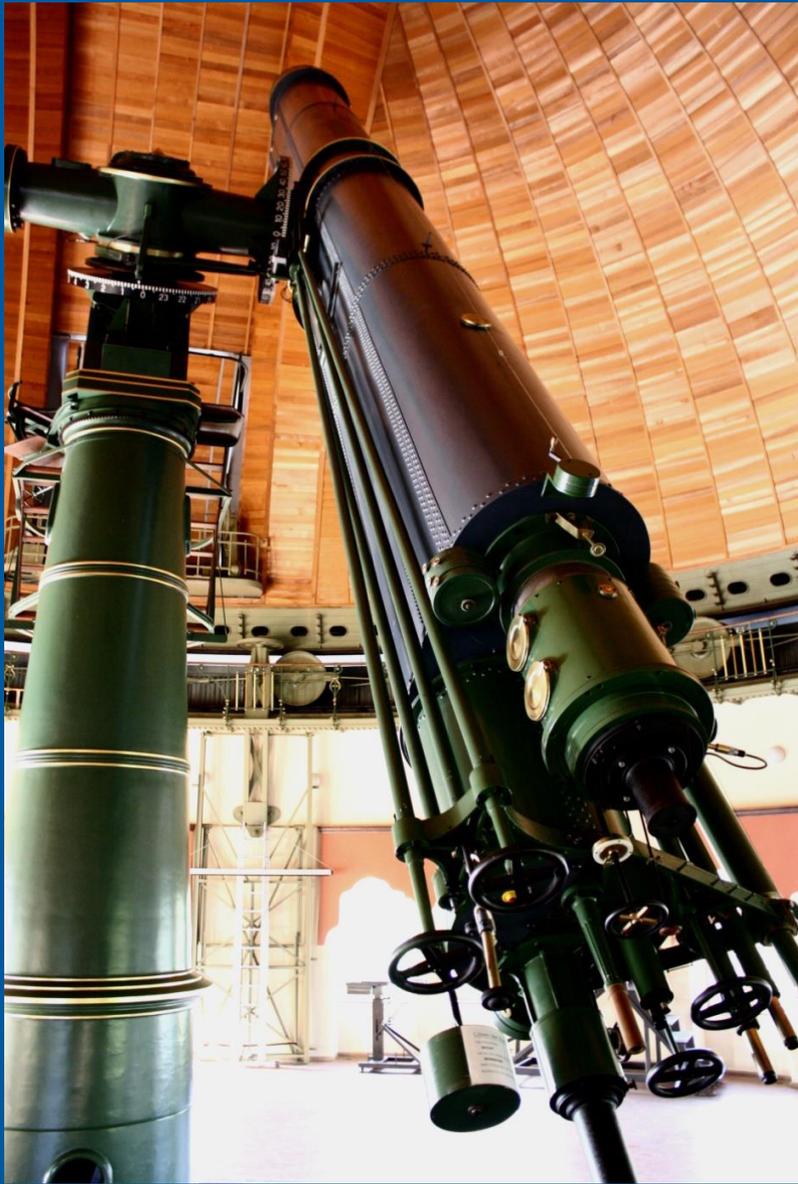
Former Astrophysical Institute / today used by Potsdam Institute for Climate Impact Research



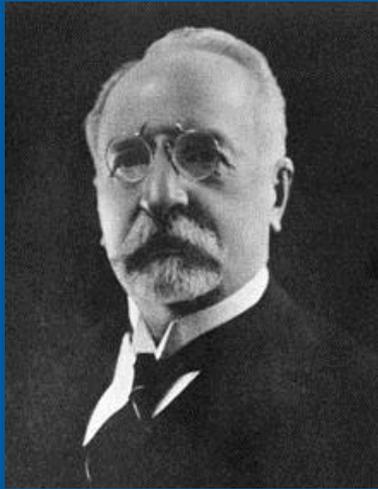
Replica of Michelson's first Interferometer (1881)



Great Refractor (built 1895-99)



# 1904: Discovery of Interstellar Medium by Hartmann



Johann Friedrich  
Hartmann (1865 – 1936)

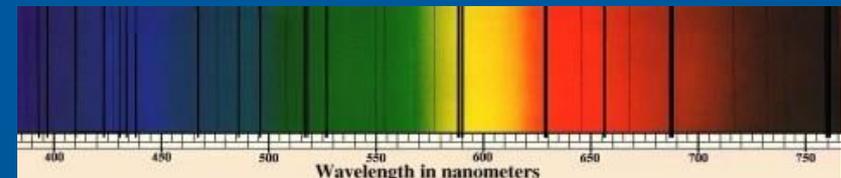


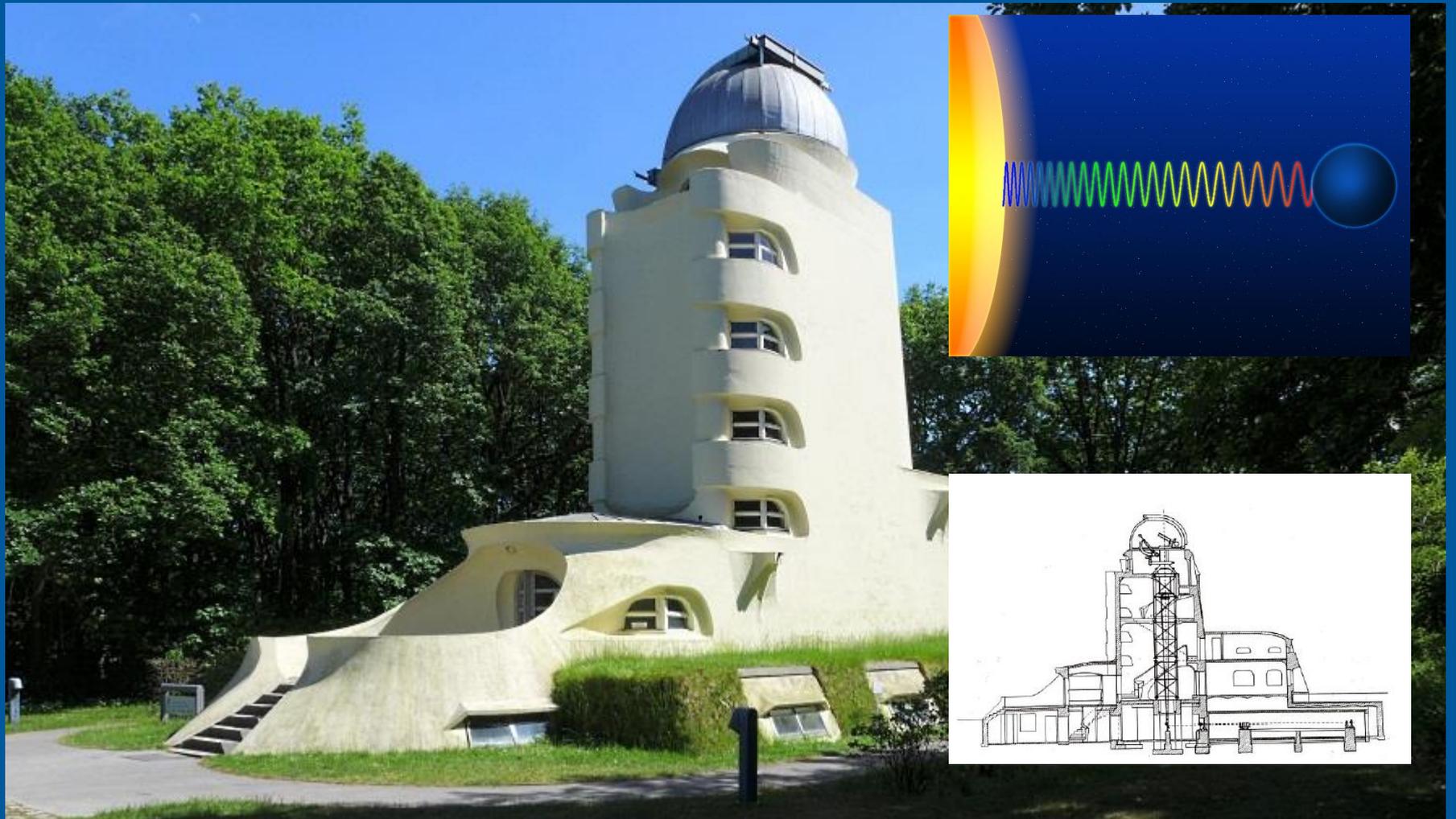
Observations of radial velocities of the binary star Delta Orionis revealed lines which did not share the orbital motion of both stellar components.

Hartmann concluded for the existence of an invisible, interstellar cloud of calcium vapor.

## *SPECTRUM AND ORBIT OF $\delta$ ORIONIS* 273

ment between the results from the different plates was decidedly less than for the other, much less sharp lines. Closer study on this point now led me to the quite surprising result that the calcium line at  $\lambda 3934$  does not share in the periodic displacements of the lines caused by the orbital motion of the star.





Solar Observatory „Einsteinturm“ (1923-25) to prove the effect of gravitational redshift



Geodetic Institute (1892 – 1895)

Ueber die  
**Grösse und Figur der Erde.**

Eine Denkschrift

zur

Begründung einer mittel-europäischen Gradmessung

nebst

einer Uebersichtskarte

von

**J. J. Baeyer,**

Generalleutnant z. D.; auswärtigem Mitglied der Königl. schwedischen Académie des Sciences Militaires; correspondirendem Mitglied der Kaiserlichen Akademie der Wissenschaften zu St. Petersburg; Ehrenmitglied der K. K. geographischen Gesellschaft zu Wien und Mitglied mehrerer gelehrten Gesellschaften.



Ölgemälde von Stankiewicz am GFZ Potsdam

**Johann Jacob Baeyer (1794-1885)**  
Generalleutnant z. D. Dr. h. c.

# Pendulum Experiments for Determination of Absolute Value of Gravity

VERÖFFENTLICHUNG  
DES KÖNIGL. PREUSZISCHEN GEODÄTISCHEN INSTITUTES

NEUE FOLGE No. 27

BESTIMMUNG  
DER  
ABSOLUTEN GRÖSZE DER SCHWERKRAFT  
ZU  
POTSDAM

MIT REVERSIONSPENDELN

VON

PROF. DR. F. KÜHNEN UND PROF. DR. PH. FURTWÄNGLER

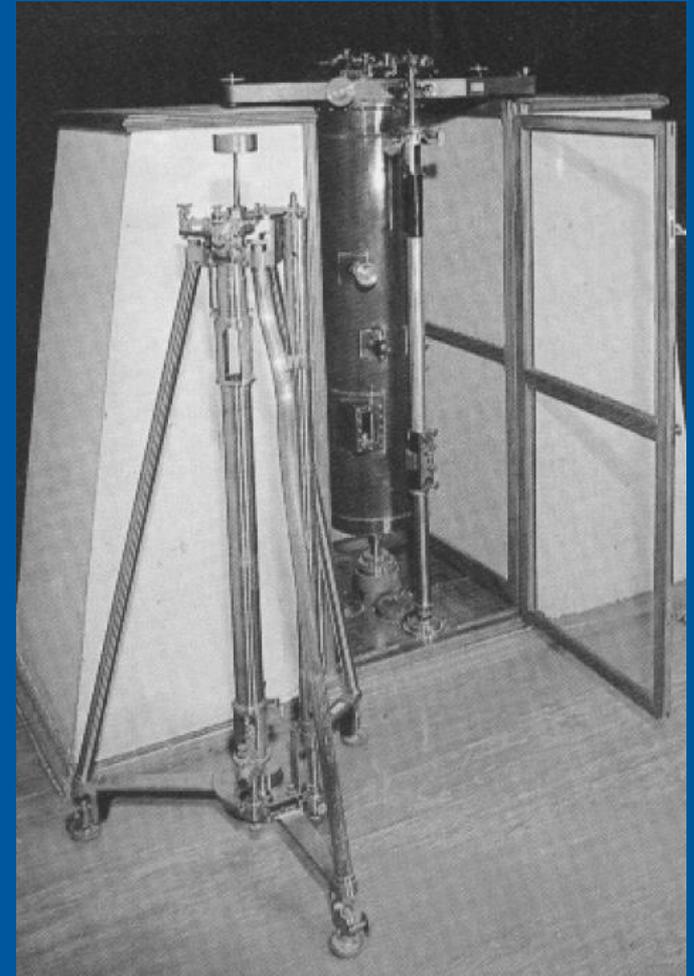


Acc. 1162



BERLIN

DRUCK UND VERLAG VON P. STANKIEWICZ' BUCHDRUCKEREI  
1906



1898 - 1904

GFZ

Helmholtz-Zentrum  
POTSDAM

HELMHOLTZ  
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<sup>1.2</sup> Global Geomonitoring and Gravity Field Prof. F. Flechtner	<sup>2.2</sup> Geophysical Deep Sounding Prof. M. Weber	<sup>3.2</sup> Organic Geochemistry Prof. B. Horsfield	<sup>4.2</sup> Geomechanics and Rheology Prof. G. Dreselt	<sup>5.2</sup> Climate Dynamics and Landscape Evolution Prof. A. Brauer	<sup>6.2</sup> Geothermal Energy Systems Prof. E. Haenges	<sup>7.2</sup> Modulare Earth Science Infrastructure Prof. M. Weber	<sup>CO</sup> Chief Information Officer Dr. W. Köckeritz	<sup>V1</sup> Human Resources Dr. B. Hörstrup
<sup>1.3</sup> Earth System Modelling Prof. M. Thomas	<sup>2.3</sup> Earth's Magnetic Field Prof. C. Stolle	<sup>3.3</sup> Earth Surface Geochemistry Prof. F. v. Blanckenburg	<sup>4.3</sup> Chemistry and Physics of Earth Materials Prof. M. Koch-Müller	<sup>5.3</sup> Geomicrobiology Prof. D. Wagner	<sup>6.3</sup> Geological Storage Dr. A. Liebscher	<sup>7.3</sup> Observatories Prof. O. Oncken	<sup>PR</sup> Public Relations J. Zets	<sup>V2</sup> Finances C. Schippmann
<sup>1.4</sup> Remote Sensing Prof. L. Guanter	<sup>2.4</sup> Seismology Prof. F. Tilmann	<sup>3.4</sup> Fluid Systems Modelling Prof. M. Kühn	<sup>4.4</sup> Interface Geochemistry Prof. L. Benning	<sup>5.4</sup> Hydrology Prof. B. Merz	<sup>6.4</sup> Centre for Scientific Drilling Dr. U. Harms	<sup>7.4</sup> Library and Information Services R. Bertelmann	<sup>IO</sup> International Office Dr. L. Stroink	<sup>V3</sup> Purchasing M. Röpke
<sup>1.5</sup> Geoinformatics Prof. D. Dransch	<sup>2.5</sup> Geodynamical Modelling Prof. S. Sobolev			<sup>5.5</sup> Earth Surface Process Modelling Prof. J. Braun		<sup>7.5</sup> Centre for Geo-Information Technology Prof. J. Wächter	<sup>GO</sup> GFZ Project Office A. N. Küppers	<sup>V4</sup> General and Technical Services Dr. M. Pestke
	<sup>2.6</sup> Seismic Hazard and Stress Field Prof. F. Cotton					<sup>7.6</sup> Computing Centre R. Köpischke	<sup>TT</sup> Technology Transfer Dr. I. Kapp	
	<sup>2.7</sup> Near-Surface Geophysics Prof. C. Krawczyk					<sup>7.7</sup> Earth System Knowledge Platform Dr. J. Lauterjung		

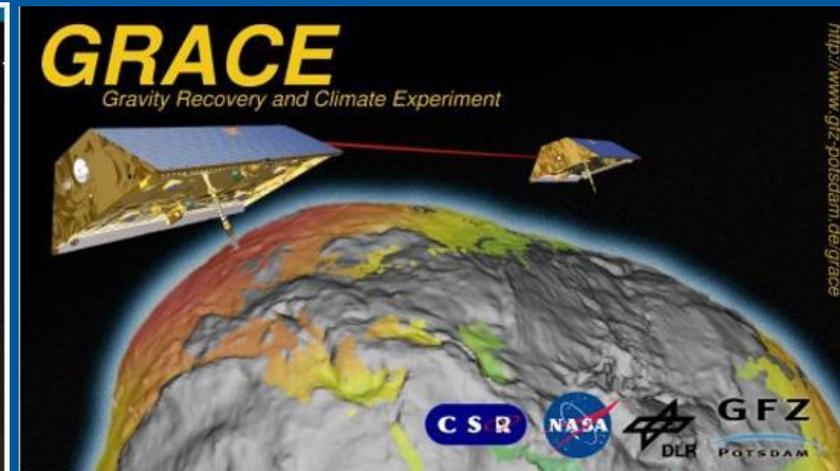
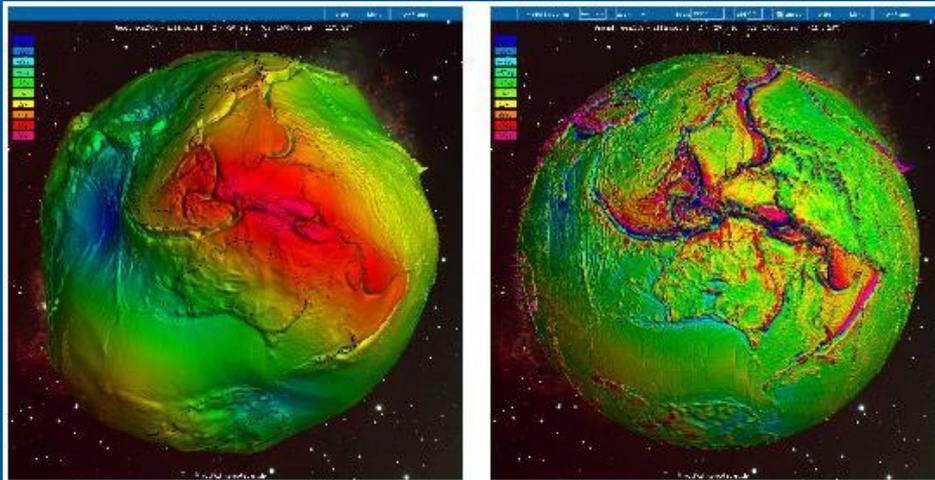
October 2016

## Section 1.2 „Global Geomonitoring and Gravity Field“

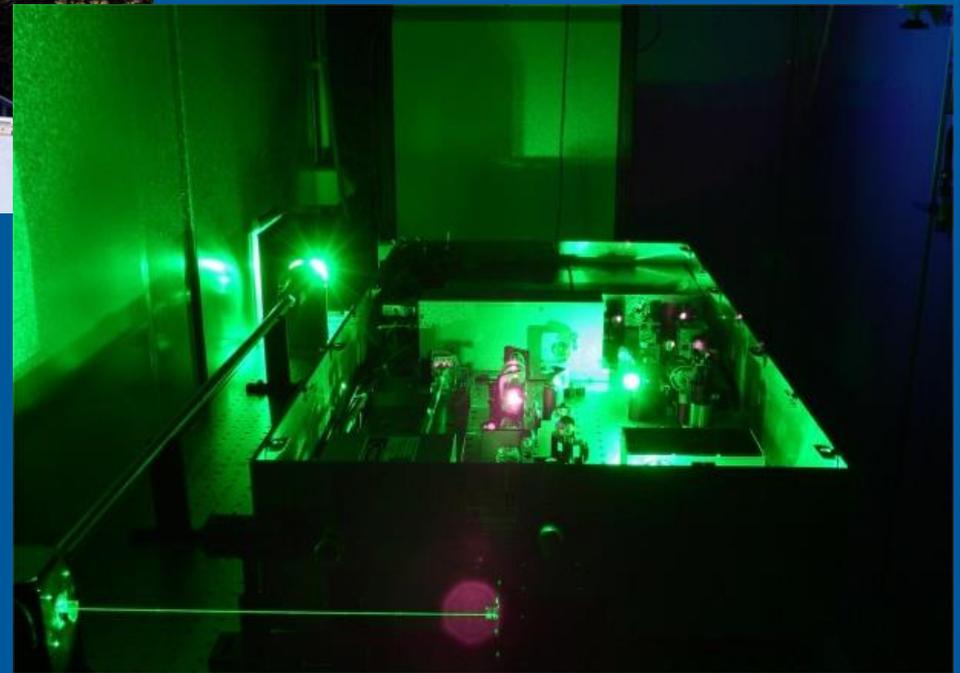
- About 30 employees, working in Potsdam and Oberpfaffenhofen, resp.

### Main Topics:

- Development, Operation and Analysis of Gravity Field Satellite Missions
- Terrestrial and Airborne Gravimetry
- Earth System Parameters and Orbit Dynamics
- Geodetic Hazard Monitoring

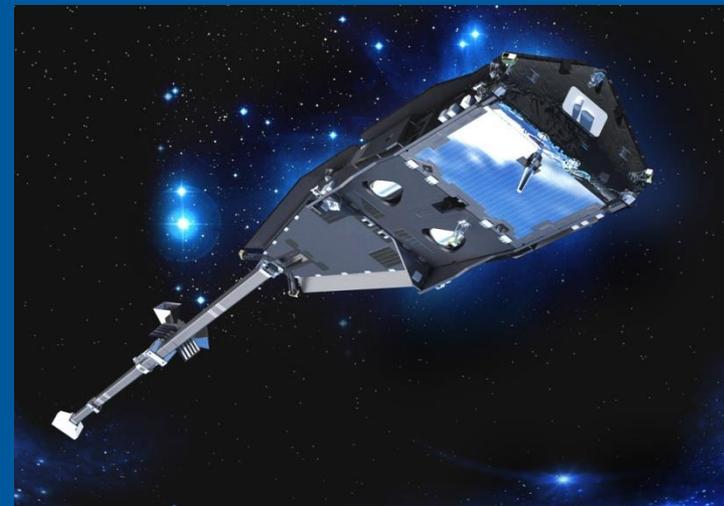
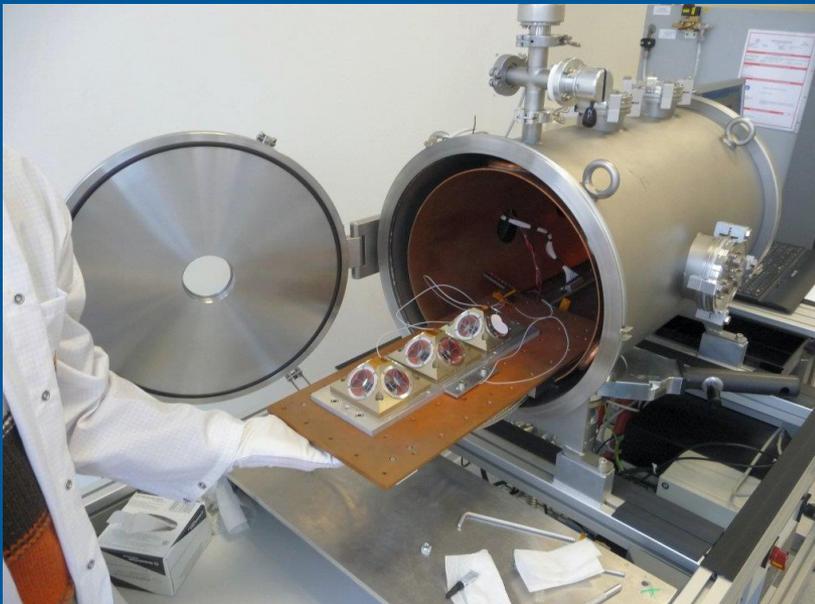
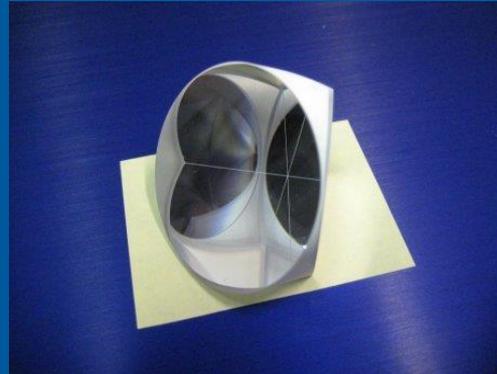


# SLR Station 7841



Operational since 2003  
Upgraded in 2011 to a kHz system

# Laser Retro Reflectors for LEO Satellite Missions



Latest: 3 LRRs for ESA's Swarm Mission (2013)

# Workshop Overview

- Dense 5 days oral program
  - Abstracts available on workshop website
  - Schedule available in printed and digital form
  - 12 minutes presentation and 2-3 minutes discussion
  - Conveners are asked to keep track on schedule
  - Presenters are asked to upload slides in time!
- Poster sessions in smaller lecture rooms 2&3.
  - Please provide your posters in time (boards will be prepared)!
- “Icebreaker” today at 18:00 (canteen above)
- Registration still possible at reception desk during breaks and in the morning
- All presentations are planned to be made available on the meeting website. People don't need to take pictures during presentations!

# Lunch

for your  
**Meal Voucher**  
you get

## **1 main course**

for preselection you can  
check the  
**menu of the week**  
in the foyer

## **1 small salad/dessert**



## **1 drink (0.2l)**



# Group Photo

- Planned at the beginning of today's 11:00 a.m. Coffee Breaks. Please come all outside (in front of the venue)!



Thank you for your attention!

