

Multiple Roles and Excellence Strategies of the Austrian Academy of Sciences

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ALLEA and the European Research Area

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THE AUSTRIAN ACADEMY OF SCIENCES

1. A learned society
2. An organization promoting young scientists
3. A research performing institution

The Austrian Academy of Sciences (AAS)

- Founded in 1847
- Autonomous status: legal entity under public law, "under the special protection of the Federal Republic of Austria"
- "Its mission is to promote the sciences and humanities in every respect and in every field, particularly in basic research."

- 3 major activities:
 - A learned society
 - An organisation promoting young scientists
 - **An organisation performing research:** 66 research facilities, 33 institutes, approx. 1.300 employees in research and administration

The Austrian Academy of Sciences as a learned society

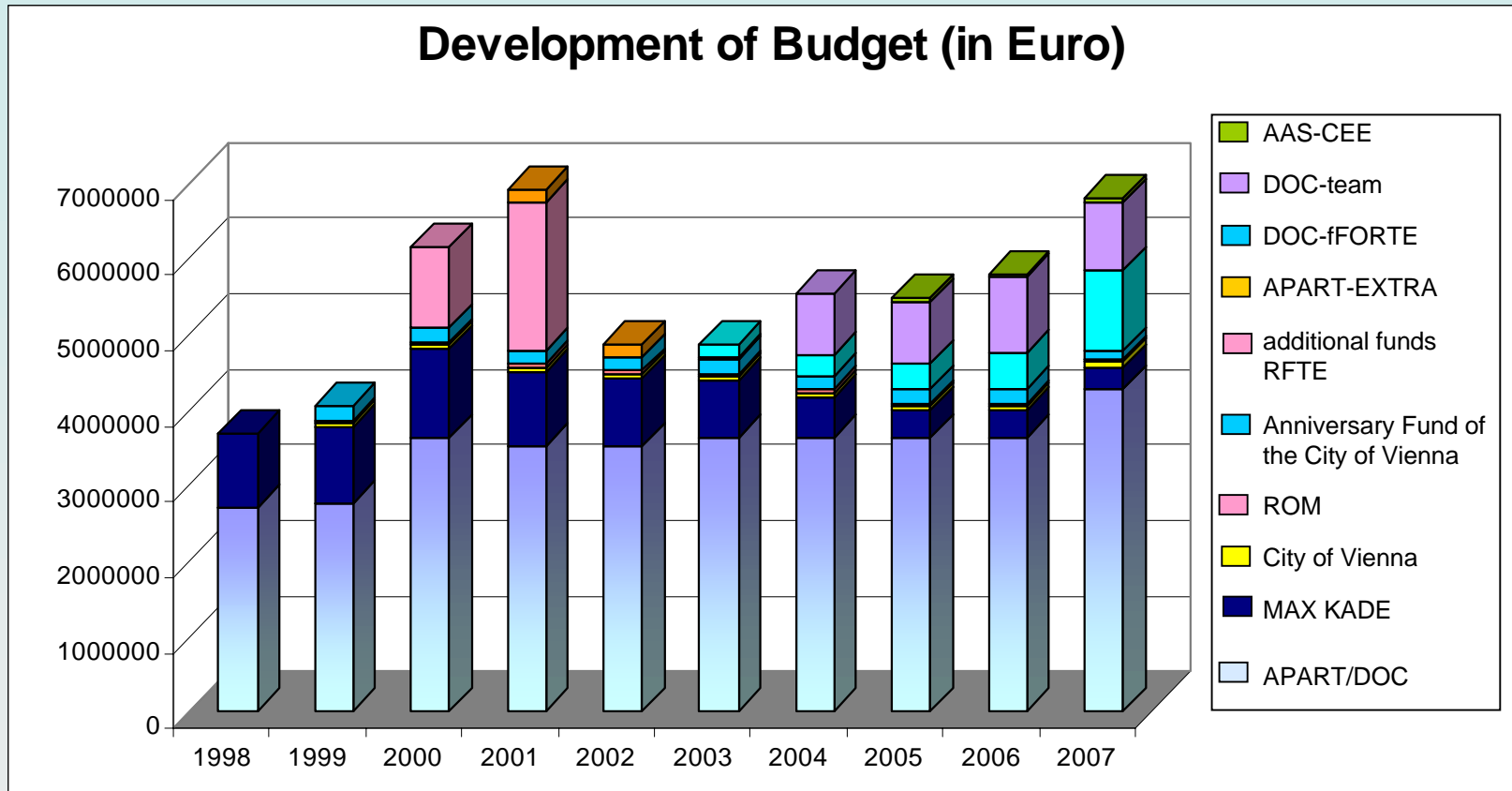
	sciences	humanities	total
full members	84	78	162
corr.members, Austrian	79	73	152
corr.members, foreign	157	142	299
honorary members	9	6	15
total	329	299	628

Young Academy (founded 2006) 70 members (currently 38)
members elected for eight years, age below 45

The Austrian Academy of Sciences as an agency promoting young scientists

Seven scholarship programs for doctoral students and post-docs ...

... among them DOCfFORTE and L'Oreal Scholarships being special programs supporting women in science



Scholarship budget within the last ten years

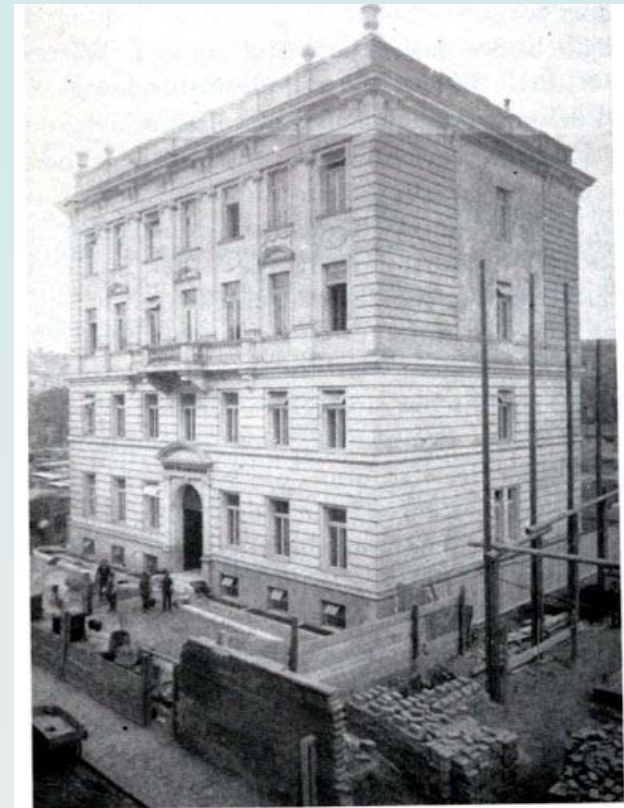
The Austrian Academy of Sciences as a research institution

1100 scientists and technicians doing research in 33 institutes and 8 centers

- Historical aspects
- A few highlights in the last few years

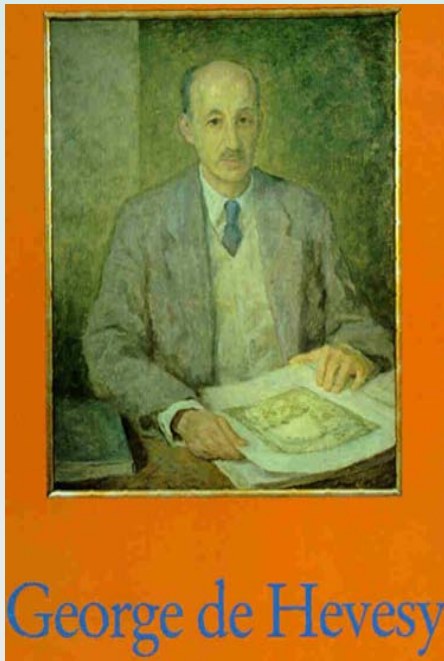
1910 ... the Institute for Radium Research
becomes the first research
institute of the AAS

Private sponsor: Dr. Karl Kupelwieser

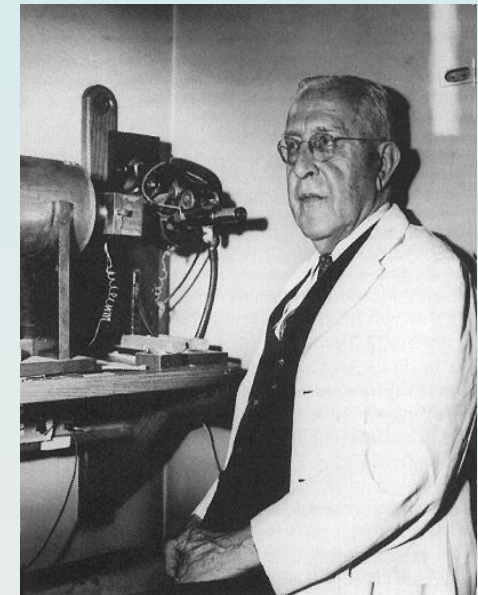


17. Institut für Radiumforschung der Wiener
Akademie der Wissenschaften (1910)

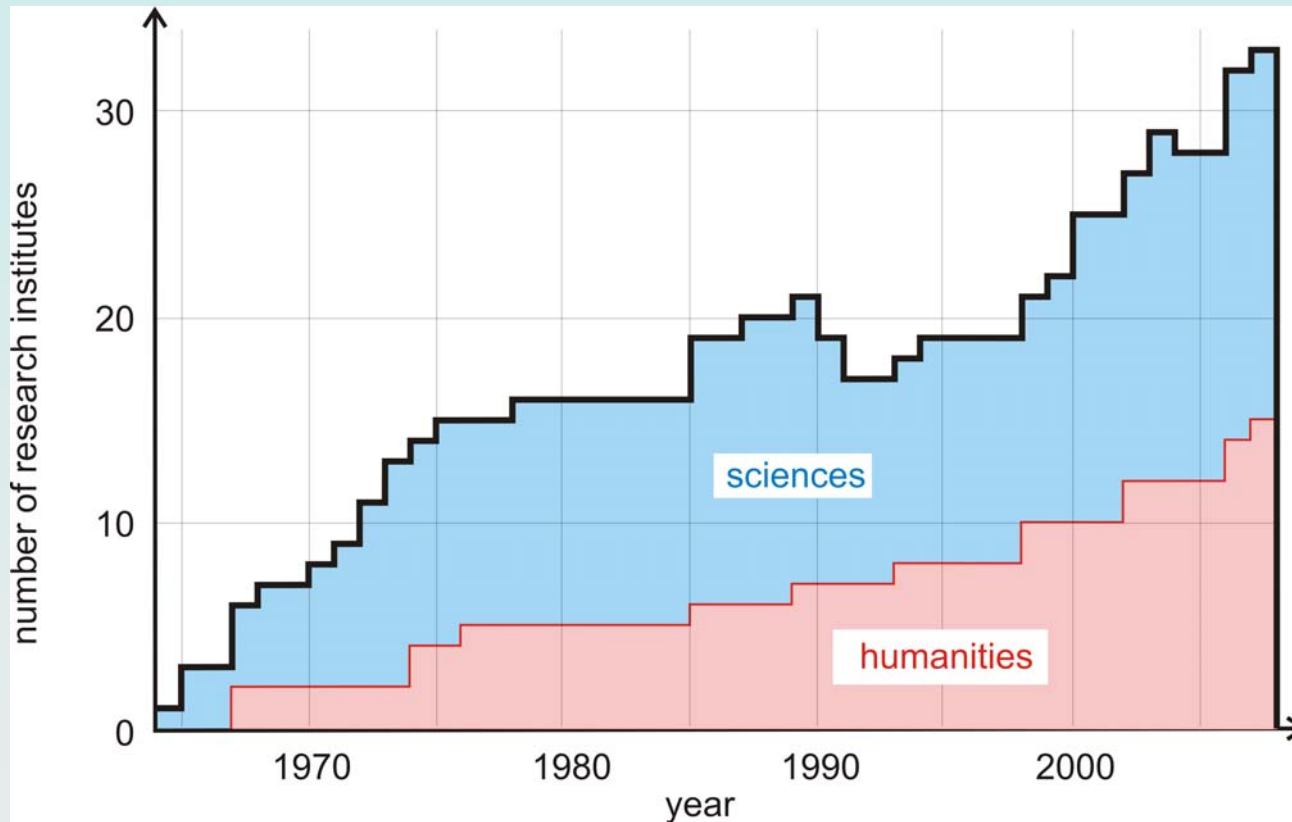
The Institute for Radium Research became an Austrian success story ...



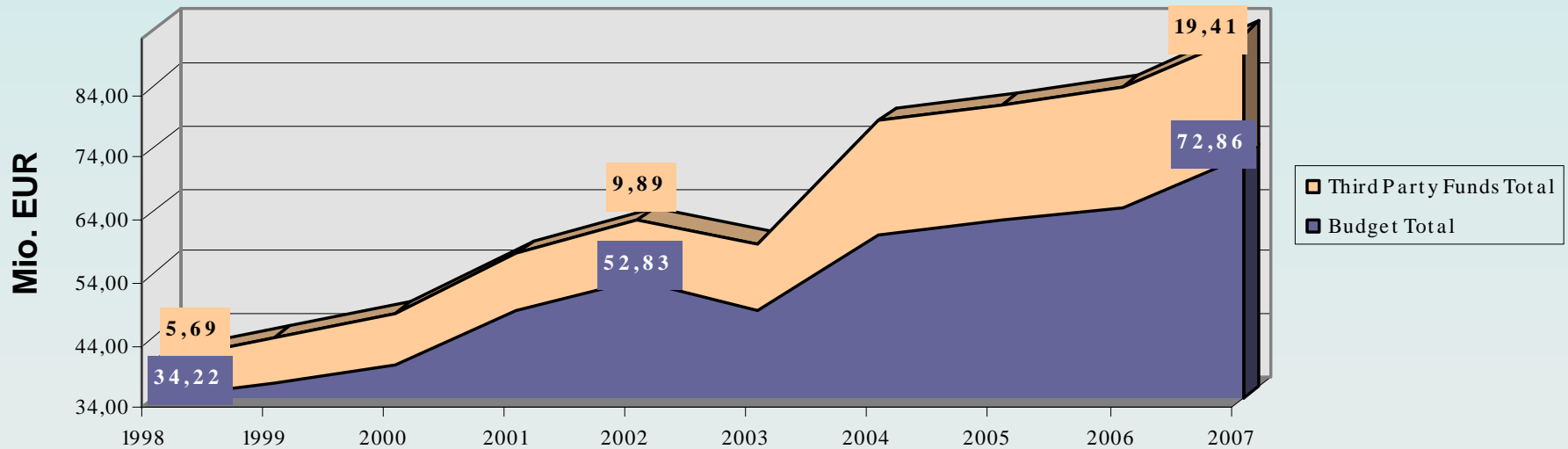
... two Nobel prizes



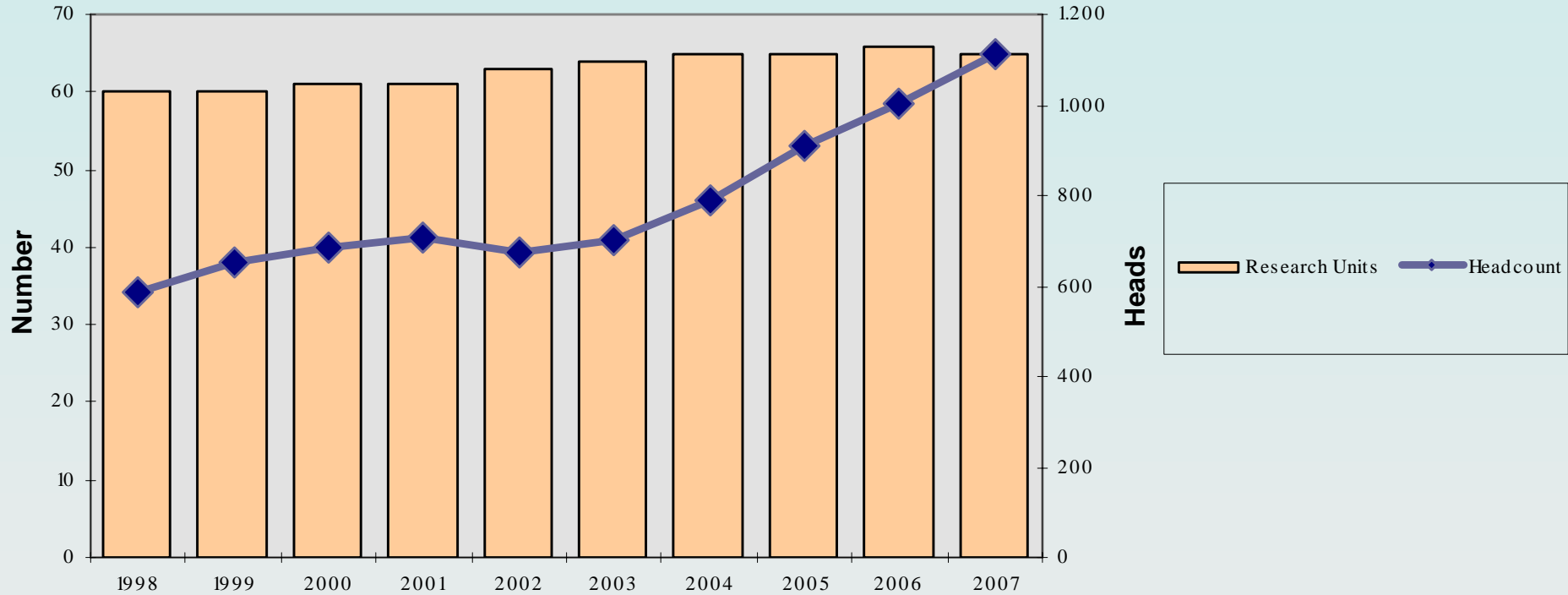
Victor Franz Heß



Two phases of expansion of the ÖAW



Funding within the last ten years



Research units and head count within the last ten years

Research at the AAS today

- **Autonomous:** oriented towards basic research – flexible
- **Heterogeneous:** covering diverse research fields and missions
- **Initiatives for new trend-setting research areas**
- **Complementary research activities (with regard to Austrian universities)**
- **Strengthening already existing excellence**
- **Room for long-term research**
- **Ensuring excellence based upon quality assessment and evaluation**

Each institute or center

- has its own international science advisory board,
- provides a research plan for five years, and
- is evaluated by an external committee every five years.

The Academy has an international research board that

- gives advice to the presiding committee in research matters,
- nominates the heads of evaluation committees, who in turn nominate all other committee members.

Institute for Biomedical Aging Research	Founded 1992
Institute for Molecular Biotechnology GmbH	Founded 1999
Research Center for Molecular Medicine	Founded 2000
Gregor Mendel-Institute for Molecular Plant Biology	Founded 2000
Johann Radon-Institute for Computational and Applied Mathematics	Founded 2003
Institute for Quantum Optics and Quantum Information	Founded 2003
Institute for Studies of Iranian Culture	Founded 2003
Institute for Demography	Enlarged 2003

Institute for Quantum Optics and Quantum Information



Innsbruck:
R. Blatt,
H. Briegel,
R. Grimm and
P. Zoller

Wien:
A. Zeilinger

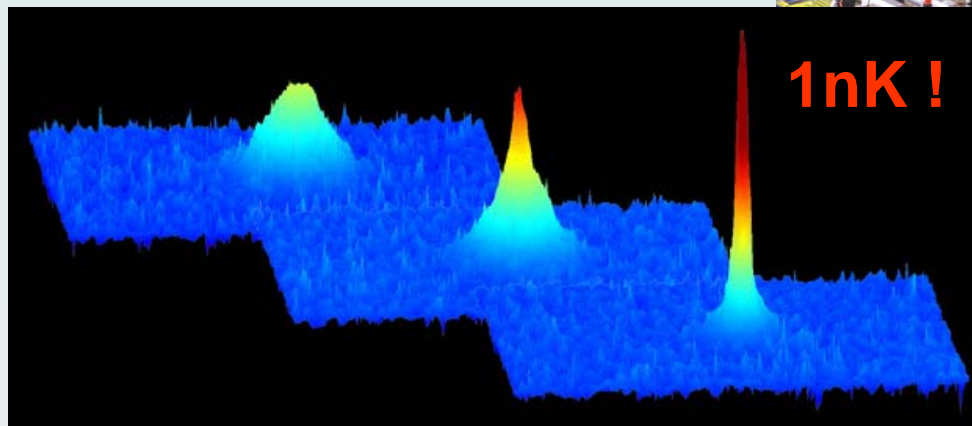
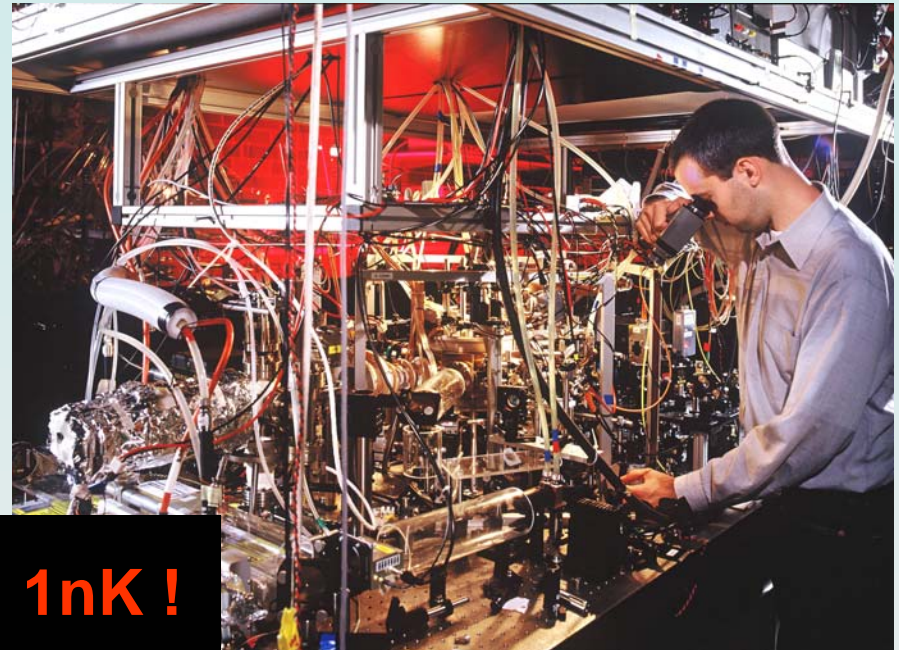


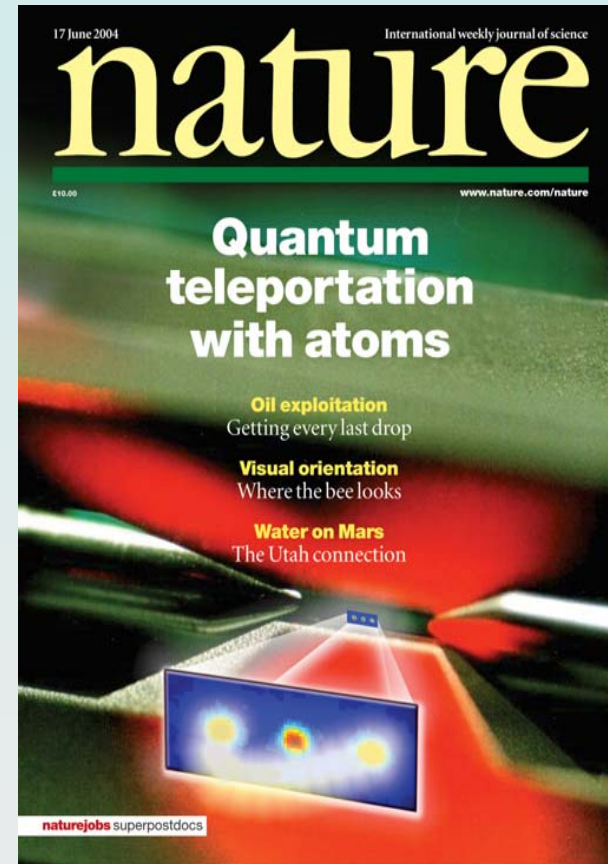
Founded by the AAS in 2003

Ultracold atoms

**investigation of novel
states of matter at very
low temperatures:**

„quantum gases“





Gregor Mendel-Institute for Molecular Plant Biology



Analysis of defective genes of the
'model plant'

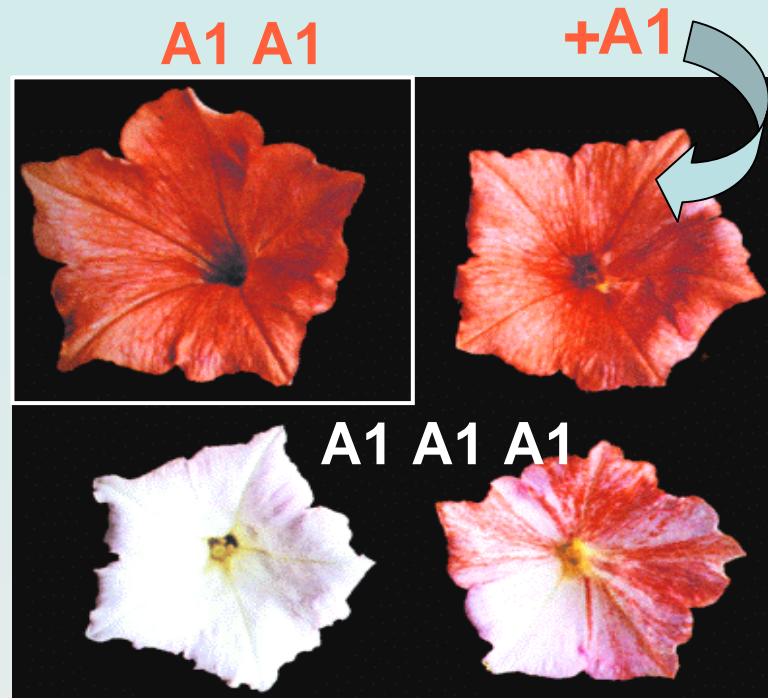
Arabidopsis thaliana

for the exploration of gene and
genome function



Founded by the AAS in 2000

two **A1**-genes
yield the red color
of the flower



additional
A1-gene

,transgene‘

three **A1**-genes:
expression of
A1-genes is
unstable

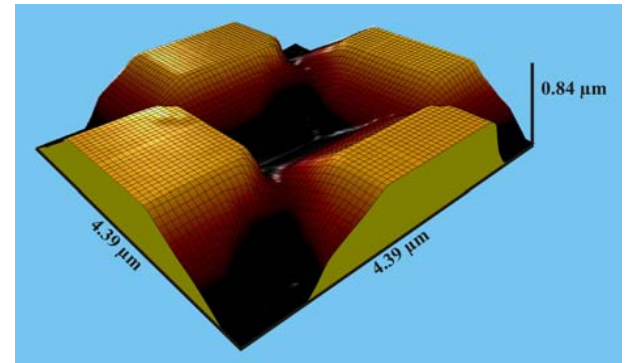
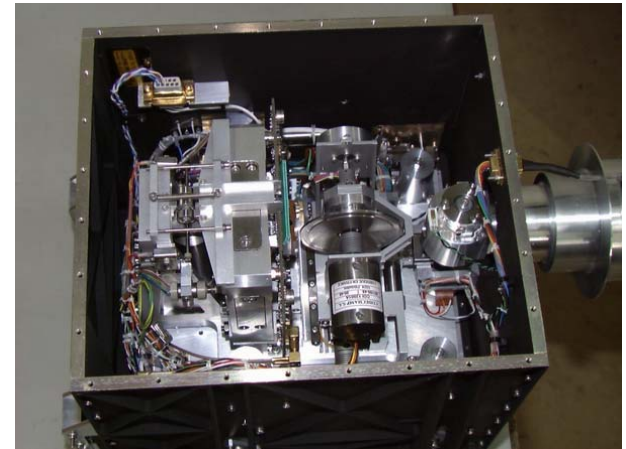
The discovery by Marjori and Antonius Matzke was a basis for
the Nobel Prize on RNA interference in 2006

Institute for Space Research of the AAS

construction of high precision instruments for
space missions

the first atomic force microscope in space

a miniature microphone to measure
weathering and storms on the Saturn
moon Titan





Director: Heinz W. Engl
Deputy directors:
Ulrich Langer und
Peter Markowich

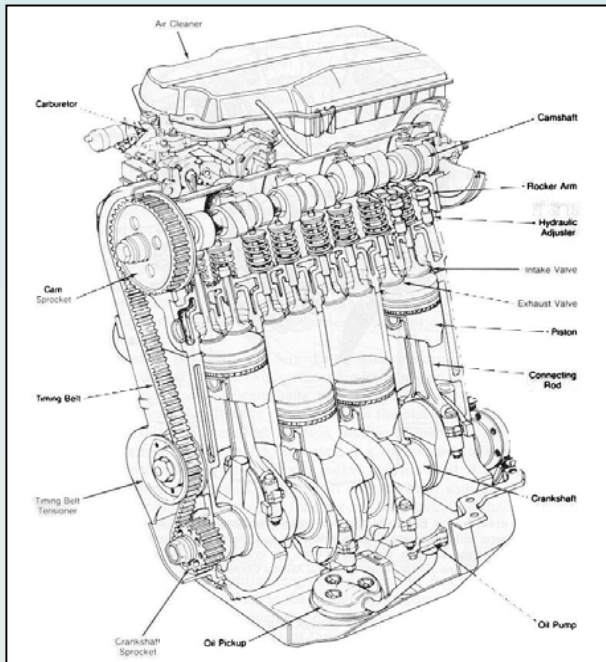
Eight research groups with group leaders from five Austrian universities

60 scientific coworkers from 15 different countries, about 50% on project money

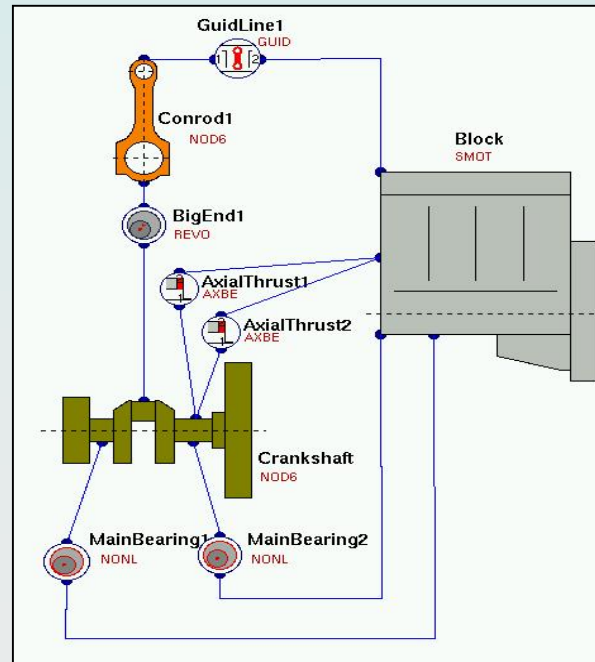
Organization of special semesters with guests from all over the world on predefined topics in applied mathematics

Design of models and development of algorithms for applications from many different disciplines

Engine



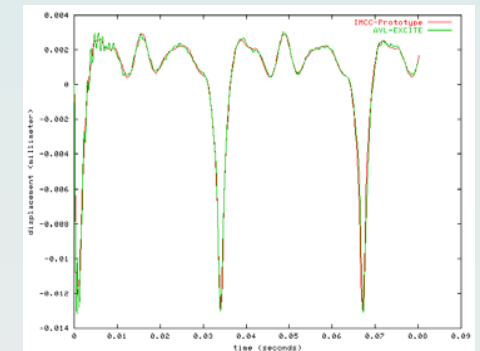
Multibody Model



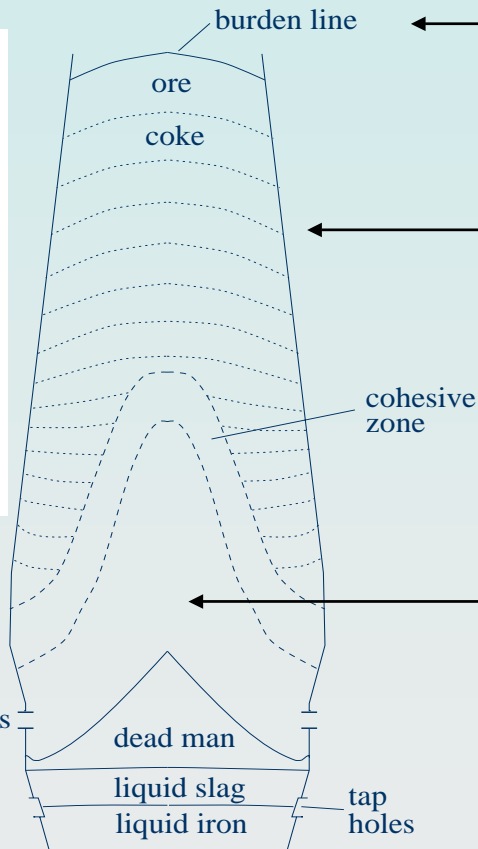
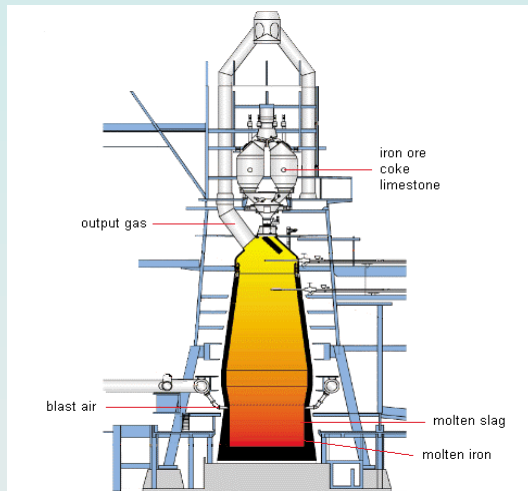
Numerical Simulation

Dynamic Simulation

• Nodal Results



- Vibration & Noise
- Bearing Analysis



charging of
ore and coke layers

indirect reduction
of ore by CO and H₂

softening / melting
of ore starts

direct reduction by FeO
dripping over C

removal of liquid iron
and slag

hot blast air inlet

tuyeres

dead man

liquid slag

liquid iron

tap
holes

THANK YOU FOR YOUR ATTENTION !