



Max-Planck-Institut  
für Radioastronomie

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IMPRS Seminar

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# CAREER PLANNING: THE SEEK FOR POSTDOC

# Layout

- ◉ Career planing: what do I really want?
- ◉ Looking for a postdoc – strategy
  - My assets
  - Papers, stays, conferences
  - Where to look and how to apply
- ◉ The application: procedures and methods
- ◉ Exit strategy – the world is more than astronomy



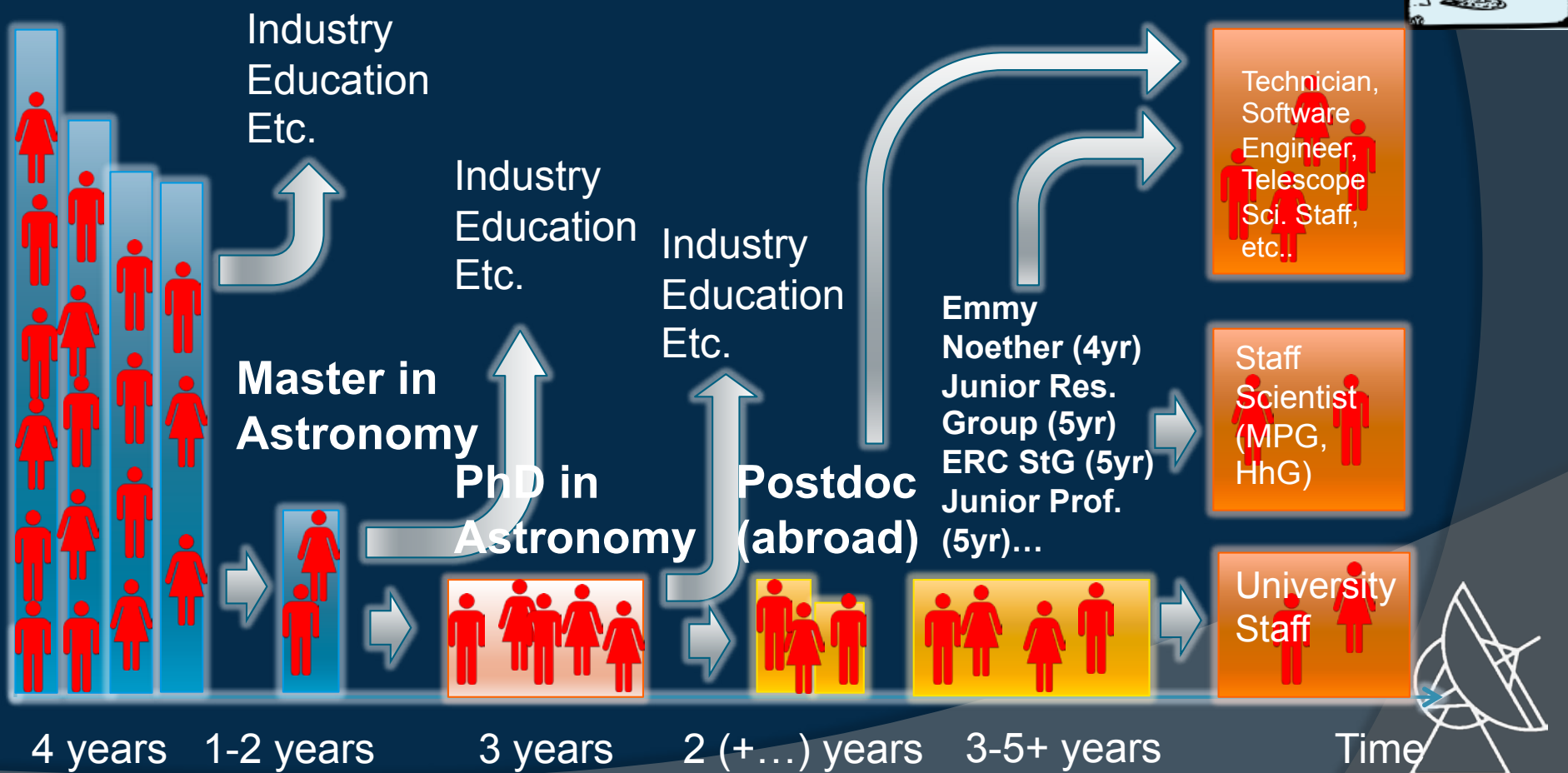


Max-Planck-Institut  
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# So you want to be an astronomer?

# Astronomer's Life Cycle

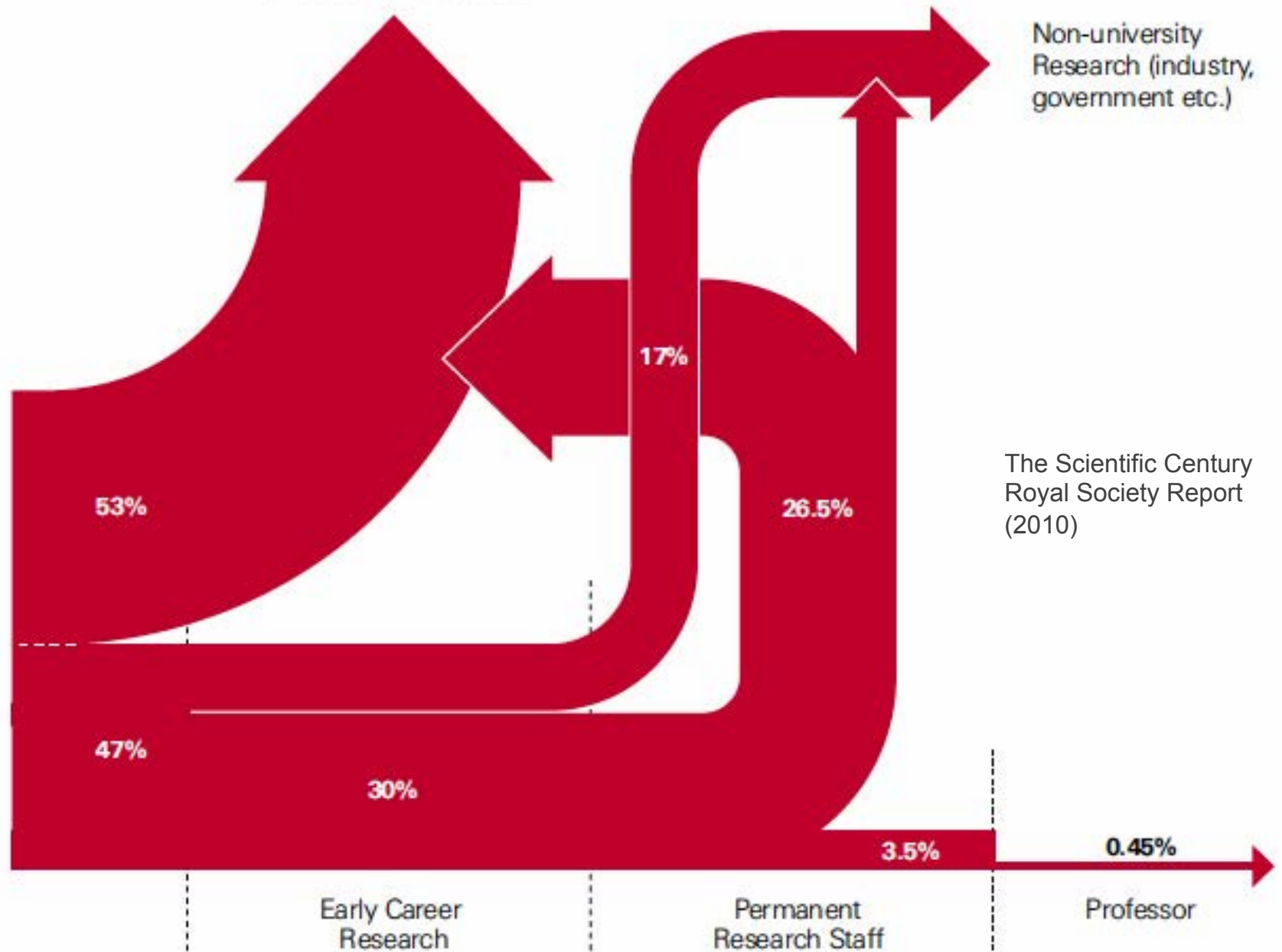
## Physics Bachelor



Careers outside science

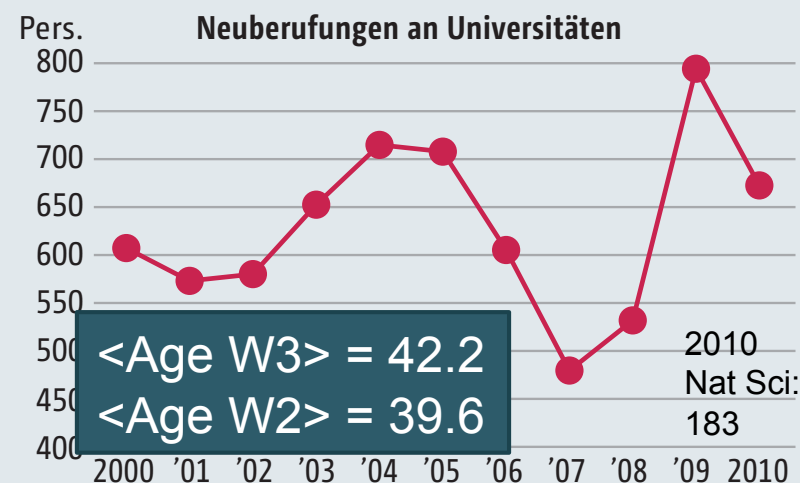
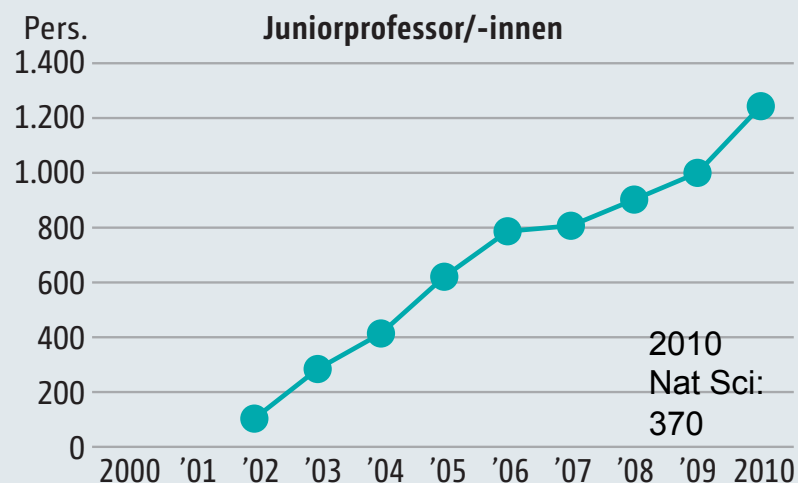
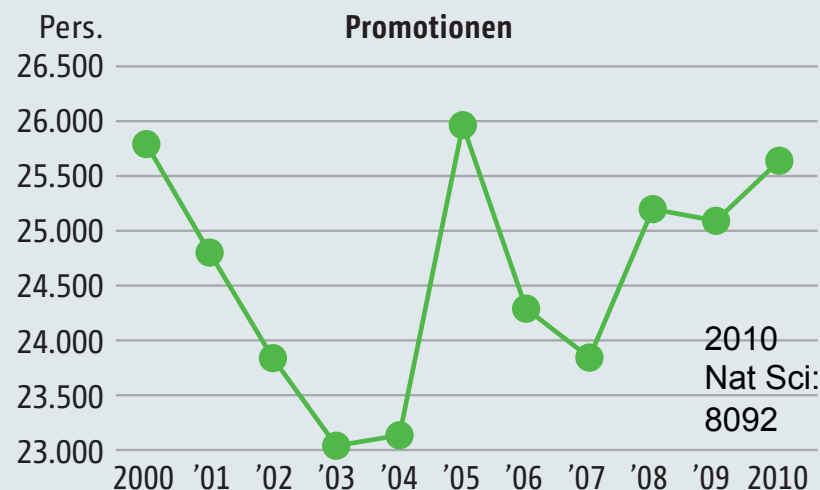
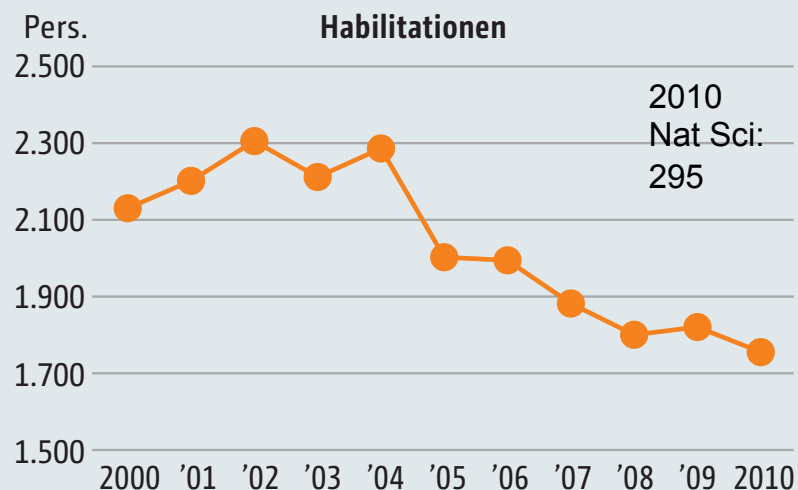
Non-university  
Research (industry,  
government etc.)

The Scientific Century  
Royal Society Report  
(2010)



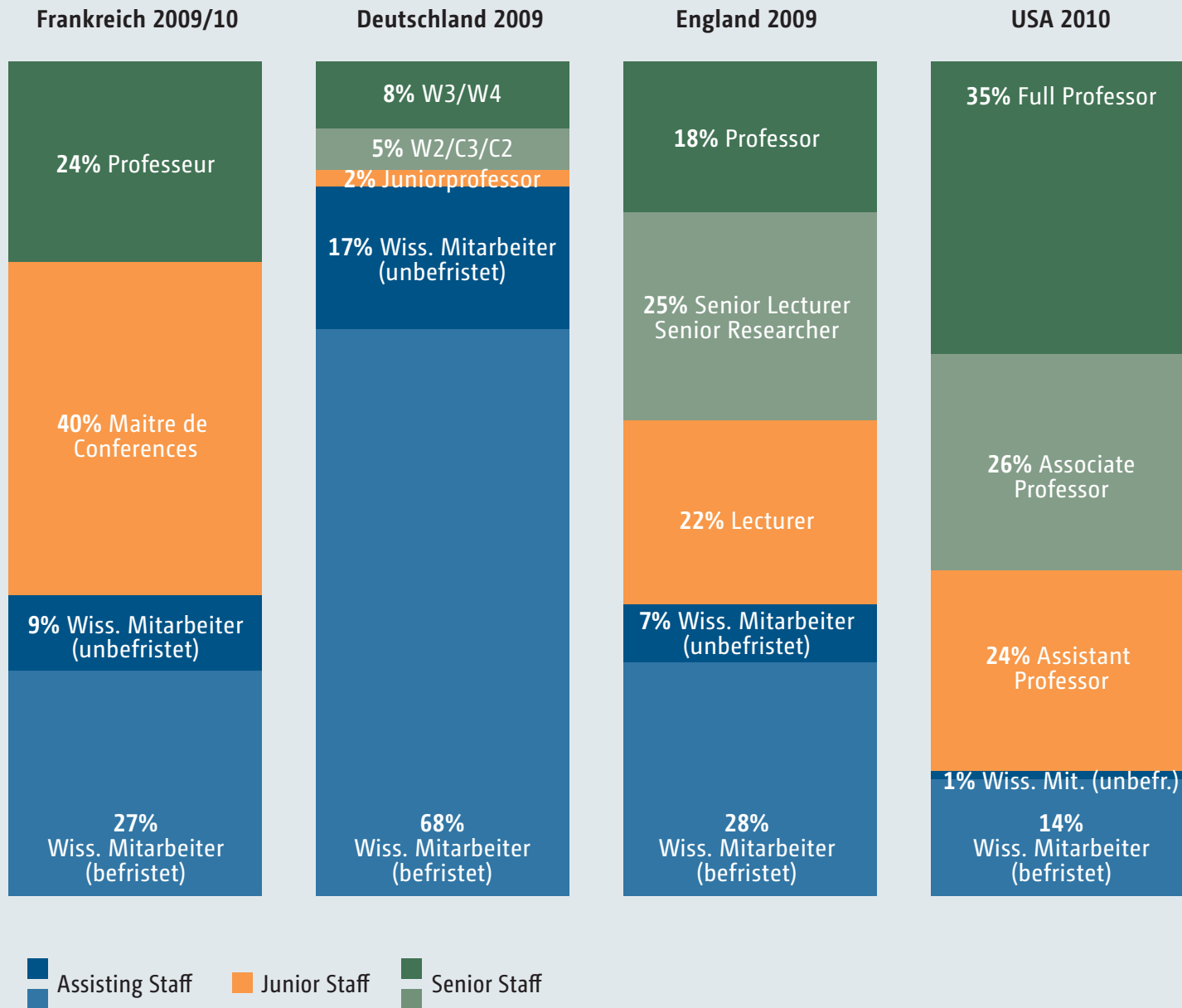
# The bottle neck

PhD/Professorship ratio in 2010:  
1:44



Quelle: Statistisches Bundesamt, Fachserie 11, Reihe 4.2, 4.4, Sonderauswertung, vgl. Anmerkungen in nachfolgender Tab.

Abb. A1-8: Hauptberufliches wissenschaftliches Personal an Universitäten in Deutschland, Frankreich, England und den USA\*



## Abb. A2-6: Die Förderkette als Nachwuchsförderungskonzept der DFG

**Förderangebote** für den wissenschaftlichen Nachwuchs nach Karrierefortschritt

Preise

### Professur oder andere wissenschaftliche Leitungsfunktion

Heisenberg-Stipendium/-Professur  
Eigene Stelle  
Forschungsstipendium (Ausland)  
Stelle im DFG-Projekt  
Wissenschaftliche Netzwerke

### Vorbereitung auf wissenschaftliche Leitungsfunktion

Emmy-Noether-Nachwuchsgruppe  
Eigene Stelle  
Forschungsstipendium (Ausland)  
Stelle im DFG-Projekt  
Wissenschaftliche Netzwerke

### Erlangung der Berufbarkeit

Post-doc GRK/GSC  
Eigene Stelle  
Forschungsstipendium (Ausland)  
Stelle im DFG-Projekt  
Wissenschaftliche Netzwerke

### Post-doc-Zeit

Heinz Maier-Leibnitz-Preis

Kopernikus-Preis

Bernd Rendel-Preis

von Kaven-Preis

Albert Maucher-Preis



# Career planning – what do I really want?



# Strategy

- ⦿ Postdoc as career step
- ⦿ Increase your 'market value' (sorry)
  - Papers / networking / methods (find a nish) / **collaborations!!**
- ⦿ How to get known
  - **Collaborations!!**
  - Scientific stay at potential postdoctoral site
  - Reporting research in international conferences
    - Oral presentation preferred
    - If poster, get the help of your supervisor to drag potential employers to see your results
  - Scientific papers – crucial for very competitive programs (e.g., NASA, Fermi, Jansky, etc.)



# The role of the supervisor

- ◉ Guide the PhD student towards scientific success
  - Distinguishing own interest from student interests
  - Goal: finish timely with novel and relevant scientific content
- ◉ Support includes the search for a postdoc
  - Help in postdoc search
  - Use networking
  - Support internships in potential employers
  - Write recommendation letters



# Why a postdoc?

Postdocs are an asset

“A postdoc expands young physicists’ networks far beyond what they can typically achieve as a doctoral student. It gives you the chance to build more collaborations and develop a network of colleagues at other institutions that you can be in touch with and work with.”

Eric Jensen  
Chair of Swarthmore’s Phys. & Astron. Dept.



# Why a postdoc?

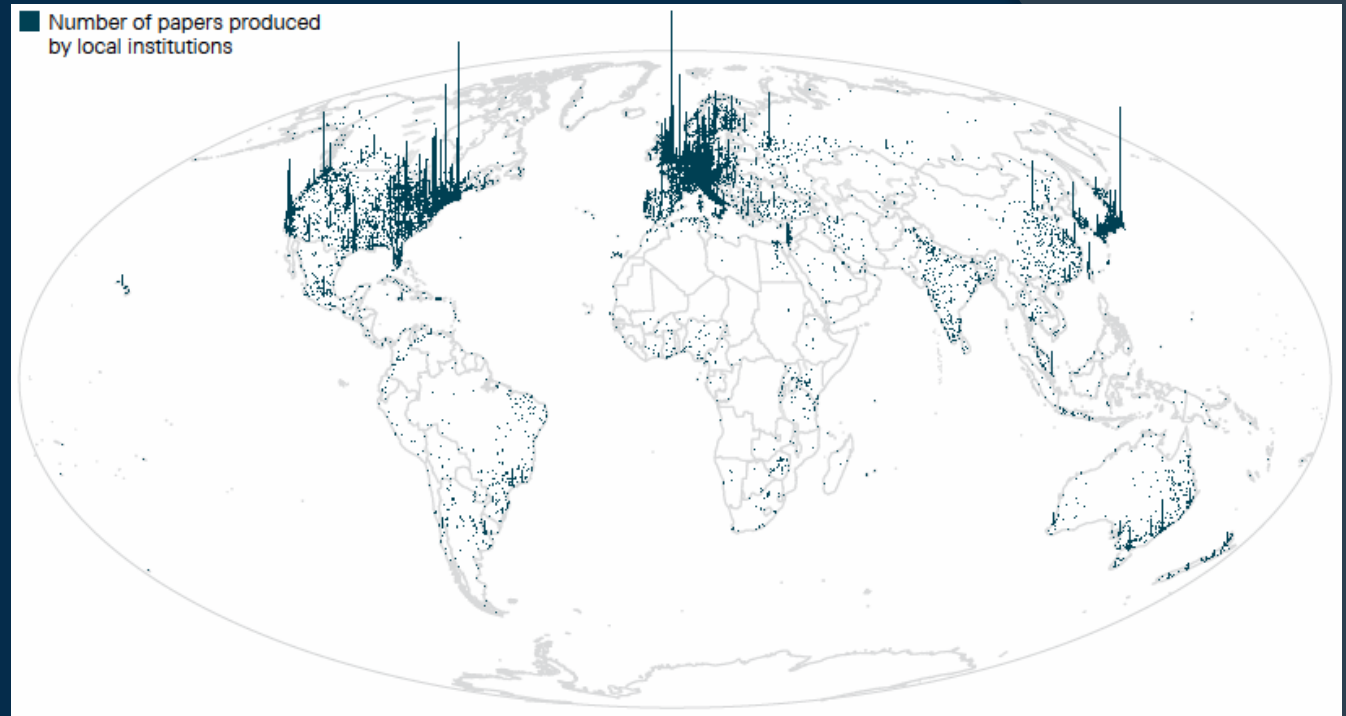
## (Naturejobs poll)

- Next step in academic career after PhD
- Love science and research
- Reach dream of becoming tenured academic
- Could not find another job
- Discover something new
- Contribute to scientific knowledge
- Don't know what else to do
- Afraid of unknown outside of academia
- Change location
- Could not find a tenure-track position
- Contribute to society
- Convenience
- Thought lab was expanding



# Mobility

Where research  
takes place  
(Royal Soc. 2010 report)



- As long as your personal circumstances allow it: move around!
- Life experience, developing new networks
- Go away from local biases to global challenges



# The 1<sup>st</sup> postdoc

- ◎ The canonic way

- Check the AAS, academics.de, etc. and apply to all (US: NASA, Hubble, Jansky, etc.; NL: Veni; EU: MSC IEF; etc.)

- ◎ Most successful approach:

- Initiative contact to the preferred postdoc destination, offer for a talk, discussion about funding



# Where to find it













- ◎ Personal contacts: the best approach !
- ◎ Job portals:
  - AAS Job Register
    - <https://jobregister.aas.org/#PostVFellow>
  - Alternative (not tailored for astronomers)
    - EURAXESS - [http://www.euraxess.de/portal/job\\_search\\_in.html](http://www.euraxess.de/portal/job_search_in.html)
    - Academics.com – <http://www.academics.com>
    - DAAD – <http://www.funding-guide.de>
- ◎ Mailing lists in your research area





# Deadline calendar

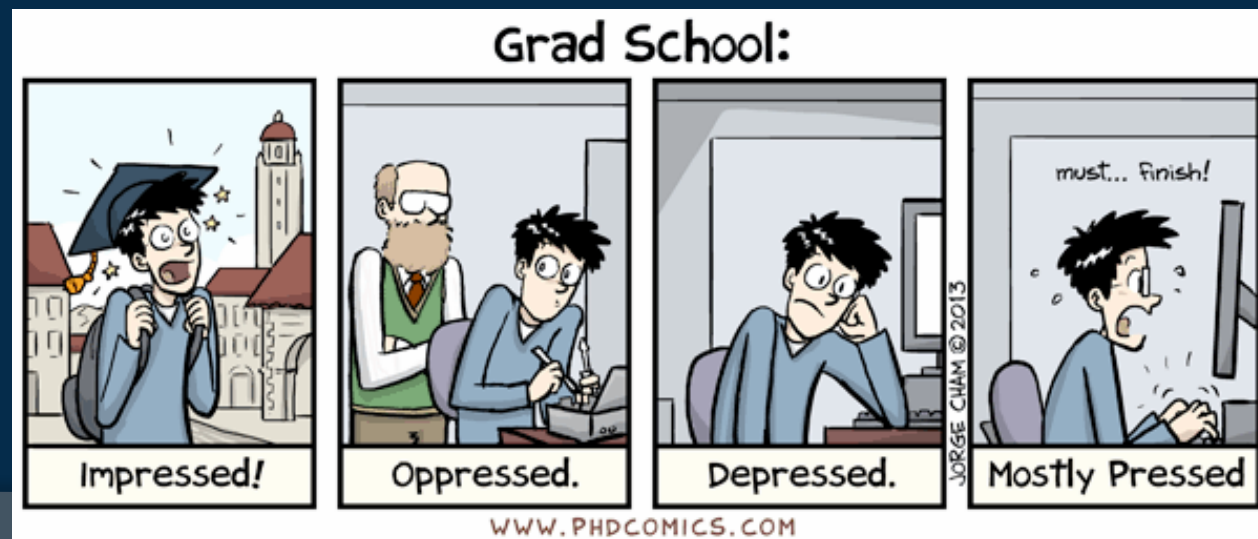
Prestigious,  
full freedom,  
quite lucrative

-  ○ Mar 1 – NASA Postdoc. Prog.
-  ○ Jul 1 – NASA Postdoc. Prog.
-  ○ **Sep 10 – MSCurie Ind. Fellowships (European & Global)**
-  ○ Oct 1 – ESA Space Science
-  ○ Oct 15 – ESO
-  ○ Nov 1 – Sagan CIT
-  ○ Nov 1 – Einstein (former Chandra / Fermi) SAO
-  ○ Nov 1 – Jansky NRAO
-  ○ Nov 1 – Harvard-CfA
-  ○ Nov 1 – Hubble STSI
-  ○ Nov 1 – Giacconi STSI
-  ○ Nov 1 – NASA Postdoc. Prog.
-  ○ Dec 1 – Gemini



# Common sense

- Plan in advance!  
Start thinking in your postdoc at the end of the 2<sup>nd</sup> PhD year
- First: talk to your supervisor
- Time management is an issue – now you have real stress
  - Writing refereed papers
  - Writing your PhD manuscript
  - Sending postdoc applications



# The application and its parts

1. Letter of statement
2. Science case
3. Curriculum Vitae
4. Letters of reference



# 1. Letter of statement

- ⦿ Address the points written in the announcement
- ⦿ Check for 'insider information' to offer something they need and is not written
- ⦿ Be clear, go directly to the point, and explain why they need you
- ⦿ Beware of too much enthusiasm or to be too neutral



## 2. The science case

- ⦿ Basics of proposal writing (observing, funding)
- ⦿ Address the main points at the beginning (Why bother / What and how / Why now / Why me)
- ⦿ Be clear and concise
- ⦿ Use figures and large fonts
- ⦿ Include GANTT charts and risk evaluation



# 3. Your background (aka the CV)

- ◉ Home institution
  - Prestigious or known for a specific topic
- ◉ Supervisor (networking!)
- ◉ Your skills (what can you do?)
  - Methods and procedures (essential!)
- ◉ Your achievements (did you really do it?)
  - Papers
  - Talks
  - Scientific stays
- ◉ Additional, useful information



# 3b. Best CV?

- Chronological
  - Classical approach, usual in academia
    - Pros: good if career is linear (academia)
    - Cons: negative effect if there are career gaps exist
- Skills-based
  - Include a career objective statement and an extended skills section
  - Tailored to the person specification in the job
    - Pros: hides career gaps and brings the recruiter to the skills field
    - Cons: modern style, caution with traditional academic employers
- Hybrid
  - Good compromise
  - Advice: match to the person specification in the job ad



# 4. The reference letters

- ◉ Most important aspect in most applications
- ◉ Supervisor: absolutely needed
- ◉ Additional referees:
  - Make sure they have (really) a good opinion of you
  - Make sure they will write it on time
  - Better if they are known in the postdoc institute





# Before applying

- ◉ Contact informally present postdocs or staff from your preferred destination
- ◉ National/international programs: contact directly the host institute and get them to write the application jointly (key issue for MSC fellows)
- ◉ Evaluate yourself in the market
  - See the astronomy jobs rumor mill at <http://www.astrobetter.com/wiki/tiki-index.php?page=Rumor+Mill> and check the successful candidates
- ◉ Inform the people to write reference letters well in advance





THE JOINT INSTITUTE FOR VLBI IN EUROPE (JIVE)

is seeking candidates for fixed-term appointment as

SUPPORT SCIENTIST

to be located at JIVE, Dwingeloo, The Netherlands.

The European VLBI Network (EVN) is an interferometric array of radio telescopes spread throughout Europe, extending into Asia, Africa, and Puerto Rico, and often observes in conjunction with the e-MERLIN interferometer in the UK and the VLBA in the US. The Joint Institute for VLBI in Europe (JIVE) operates the EVN VLBI and is actively developing exploitation of real-time arrays observing with the Dwingeloo, the Netherlands institute. Several Dutch universities and other radio-astronomy institutes throughout Europe provides for a vibrant research atmosphere. For further information regarding JIVE and the EVN, refer to [www.jive.nl](http://www.jive.nl) and [www.evlbi.org](http://www.evlbi.org).

We invite applications for the position of JIVE Support Scientist, available from November 2014. The position has a 50-50 split between support duties and the appointee's own research. Principal support responsibilities include:

- assisting EVN users to schedule and analyze VLBI experiments.
- monitoring EVN performance through dedicated test observations.
- overseeing the correlation of experiments: data-quality review,
- preparation of PI/station feedback, liaison with users, etc.
- maintaining/developing features of the EVN pipeline.
- testing new correlator/network capabilities.

The position may also involve a modest amount of other local-service collateral duties, such as visitor coordination or organizing colloquia.

The position requires a Ph.D. in astronomy or other relevant field, and a solid foundation in radio interferometry techniques. Interest in VLBI processing software would be a plus. Applicants of any nationality are eligible to apply. A good command of written and spoken English is essential.

The appointment is offered for one year in the first instance with the possibility of an extension up to a total of three years. The appointee will be in the formal employ of the Netherlands Organization for Scientific Research (NWO). The position carries a competitive salary plus an excellent package of secondary benefits, including relocation expenses.

## SUPPORT SCIENTIST

**November 2014. The position has a 50-50 split between support duties and the appointee's own research. Principal support responsibilities include:**

# A dilemma?



# Pure postdoc vs support position

- Many job offers include 50% of service
- Good deal for employer and employee
- Risk: the 50% becomes a 90%
  - Verify before applying with present support scientists (informal contact)
- Make clear the terms in the negotiation for position
- Pros:
  - Develop technical skills for later technical position
  - Get involved in projects as support
  - Know a facility to exploit its maximum potential: eases networking
- Cons:
  - Less time left for your own research, may have an impact in the publication record
  - Frustration potential about own research
  - Limitations in availability



# Once you are abroad

- ◉ Stay tuned to

- German Scholars Organization (GSO)
- German Academic International Network (GAIN, sponsored by AvH/DAAD/DFG)

- ◉ Keep networking in Germany

- Visit AG meeting
- Scientific stays (check for DAAD funding)
- Offer colloquia during private visits to DE

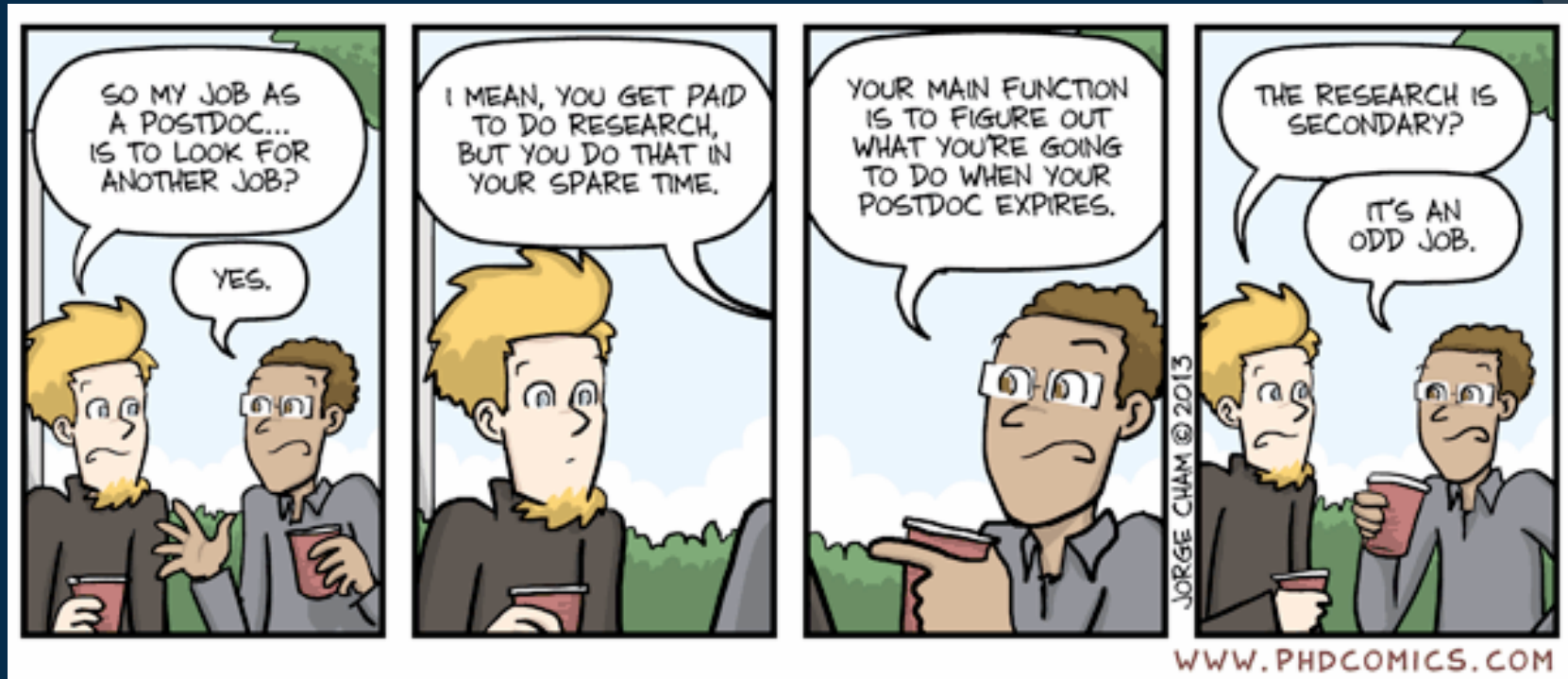


# Beyond the 1<sup>st</sup> postdoc

- ⦿ Again: what do I really want?
  - Status / security / interesting activity / international presence / teaching / training / service
- ⦿ Alternatives:
  - Leaving research?
  - Returning to Germany?
  - Changing research topic?



# Beyond the 1<sup>st</sup> postdoc





# Changing the research topic?

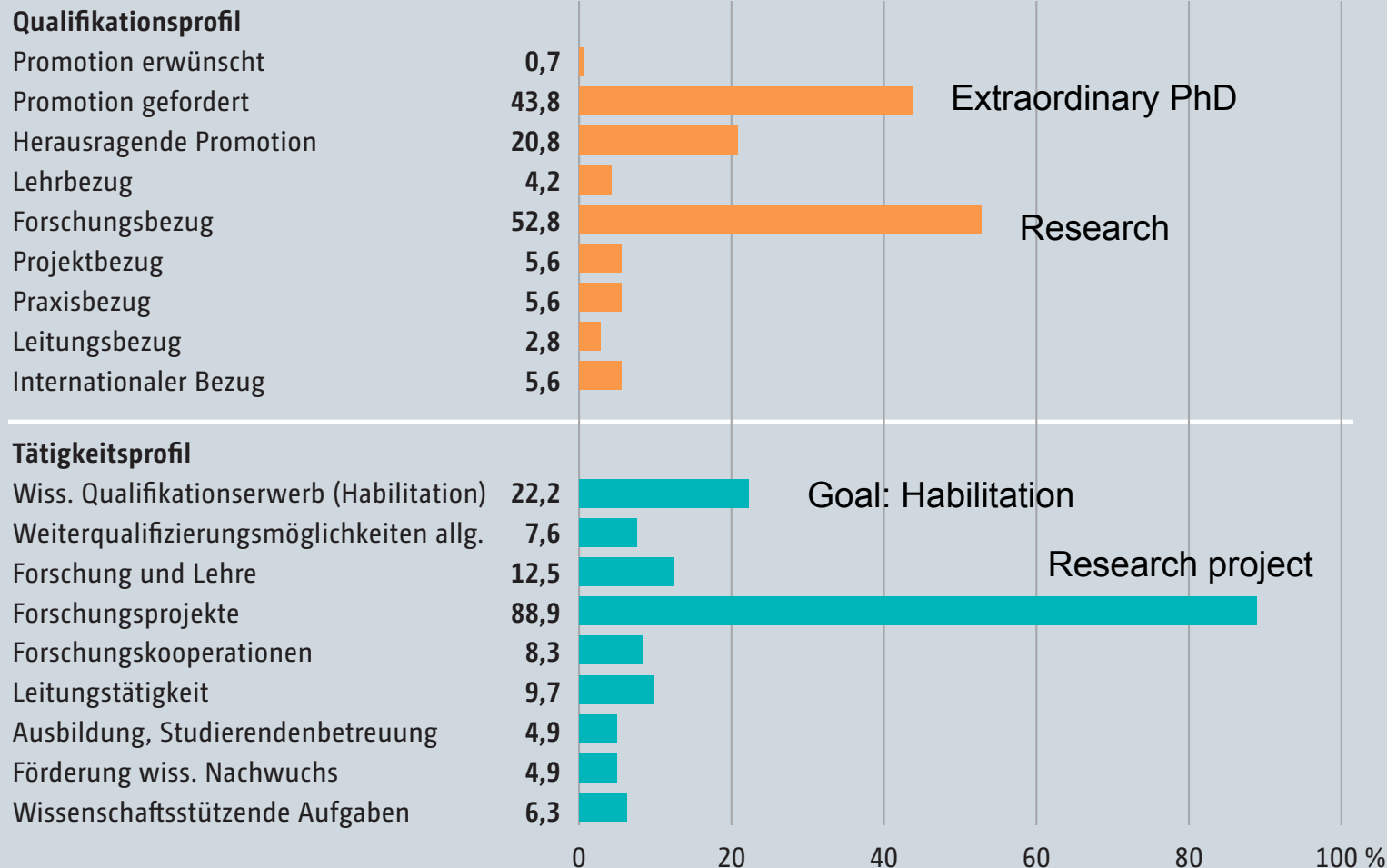
- ◉ Nobody has a glass sphere to see what is 'cool' in the 2020s and 30s
  - Present: accelerating universe, black holes, exoplanets, ...
- ◉ Money pays jobs: where is the money?
  - Check EU AstroNET and US decadal review
  - Investment in large facilities, produce science in 10-20 yr time, needs operators and scientific exploitation: ALMA, VLA, SKA, space observatories (JWST, X-rays?)
  - Lobby work of present science gurus, will sustain over the next 20yr: look to the webpages of MIT, CfA, MPG



# Postdoc in Germany

## The demand

**Abb. A3-36: Qualifikations- und Tätigkeitsprofil der ausgeschriebenen Stellen für Post-docs (in %)**



Source: Die Zeit, Jan-Jun 2011



# Further steps in the career

- ◉ Emmy-Noether-Gruppe (2-4 years after PhD)
- ◉ ERC
  - Starting grant (2-7 years after PhD)
  - Consolidator grant (7-12 years after PhD)
- ◉ Junior Professorship
- ◉ Akademischer Rat
- ◉ Scientific staff (Wiss. Mitarbeiter)
  - Also for academia in several universities, in nine new state university laws (LHG)



# German framework (i)

- Federal high education law (HRG) prevents fixed-term positions beyond 12 yr after MSc/Diploma
- Falling relative number of professors (2000:12%, 2010:9%), rising assistant personnel (21% to 25%)
- Extremely thin senior staff level
- Rising personnel as 3<sup>rd</sup>-party funded (36% to 43%) in fixed-term positions (79% to 90%) and in part time (38% to 45%)
- Tenure-track is very rare (only 3 states)
- 16% of PhD are summa cum laude
- 32% of PhD are in natural sciences
- Number of 'Habilitationen' sinking (average age, 40.8), only 7% of earlier PhD theses



# German framework (ii)

- Habilitation/Junior Professor/Staff Member/Industry recognised as qualification to become professor
- Junior Research Group leadership being established as recommended path
- Ca 400 junior professors in natural sciences at present
- Rising number of foreign students (esp. women, 70%)
- Internationalisation stops at later career levels (7% habilitationen, 8% professorships)



# German framework (iii)

- ◉ Most doctors leave academia in a mid-to-long term
- ◉ 6 yr after PhD: 80% of temporary contracts in academia, 60% in research labs
- ◉ High relative PhD number, higher number leaving research
- ◉ Doctors are demanded for management positions
- ◉ Satisfaction as scientific staff
  - Positive concerning activity areas
  - Negative concerning career path, research situation, perspectives
- ◉ Scientific staff in Germany in international context
  - Above-average temporary positions
  - Lower wages than in industry



# Employment outside academia

## The “classic ones“

Max Planck Institutes

Helmholtz Institutions

Fraunhofer Institutes

Leibniz Institutes

Federal institutions with research responsibilities  
[DLR, Bdanstalt. für Arbeitsschutz & Arbeits-  
medizin, Robert-Koch-Inst., Bundesz. für ges.  
Aufklärung]



Further non-university  
research institutions,  
usually with third-party-  
funded orientation or profit  
generating intention

## Research departments in a company

For example Bayer, Novartis etc.

Trainee-programmes



# Junior Research Groups & Junior Professorships

- ⊙ MPG
  - Otto-Hahn-Gruppe
  - Max-Planck-Forschungsgruppe (125 /yr)
  - Minerva-Program
- ⊙ DFG
  - Emmy Noether (57 /yr)
  - Heisenberg Program
- ⊙ Helmholtz-Nachwuchsgruppe (150 /yr)
- ⊙ Leibniz-DAAD Research Fellowship Program (100 /yr)
- ⊙ Fraunhofer Attract Program (20 /yr)
- ⊙ Volkswagen Foundation Lichtenberg Professor
- ⊙ Alexander-von-Humboldt Stipendium
- ⊙ DAAD postdoc program



# Postdoc in a research lab

- 80-90% of the lab **technical** positions are filled by former postdocs (e.g. Los Alamos National Lab)
- Renewals are equivalent to tenure-track assistant-professor posts and likely lead to permanent positions



# Research labs in Germany

- European Space Observatory (international)
  - <http://www.eso.org/public/employment.html>
- Max Planck Society
  - MPI Astronomy / MPI Astrophysics / MPI Extraterrestrial Physics / MPI Gravitational Physics / MPI Physics / MPI Nuclear Physics / MPI Radio Astronomy / MPI Solar System Research
- Helmholtz Association
  - Deutsches Elektronen Synchrotron DESY / German Aerospace Center DLR / Forschungszentrum Jülich / German Research Centre for Geosciences GFZ / Karlsruhe Institute for Technology KIT / Institute for Plasma Physics IPP
  - [http://www.helmholtz.de/en/working\\_at\\_helmholtz/job\\_vacancies/](http://www.helmholtz.de/en/working_at_helmholtz/job_vacancies/)
- Fraunhofer Society
  - <https://recruiting.fraunhofer.de/Jobs/2?lang=eng>
- Leibniz Association
  - Kiepenheuer-Inst. für Sonnenphysik KIS / Inst. für Astrophysics Potsdam AIP
  - <http://www.leibniz-gemeinschaft.de/nc/en/karriere/stellenangebote/>





# Fields in which physicists work

## Research

- > Universities
- > Non-university research institutions [MPI, Fraunhofer-, Leibniz- or Helmholtz-Institutes]
- > Privately funded research institutes
- > Federal research institutes

## Industry

- > Automotive industry
- > Aerospace industry
- > Measurement & control technology
- > Medical technology
- > ...

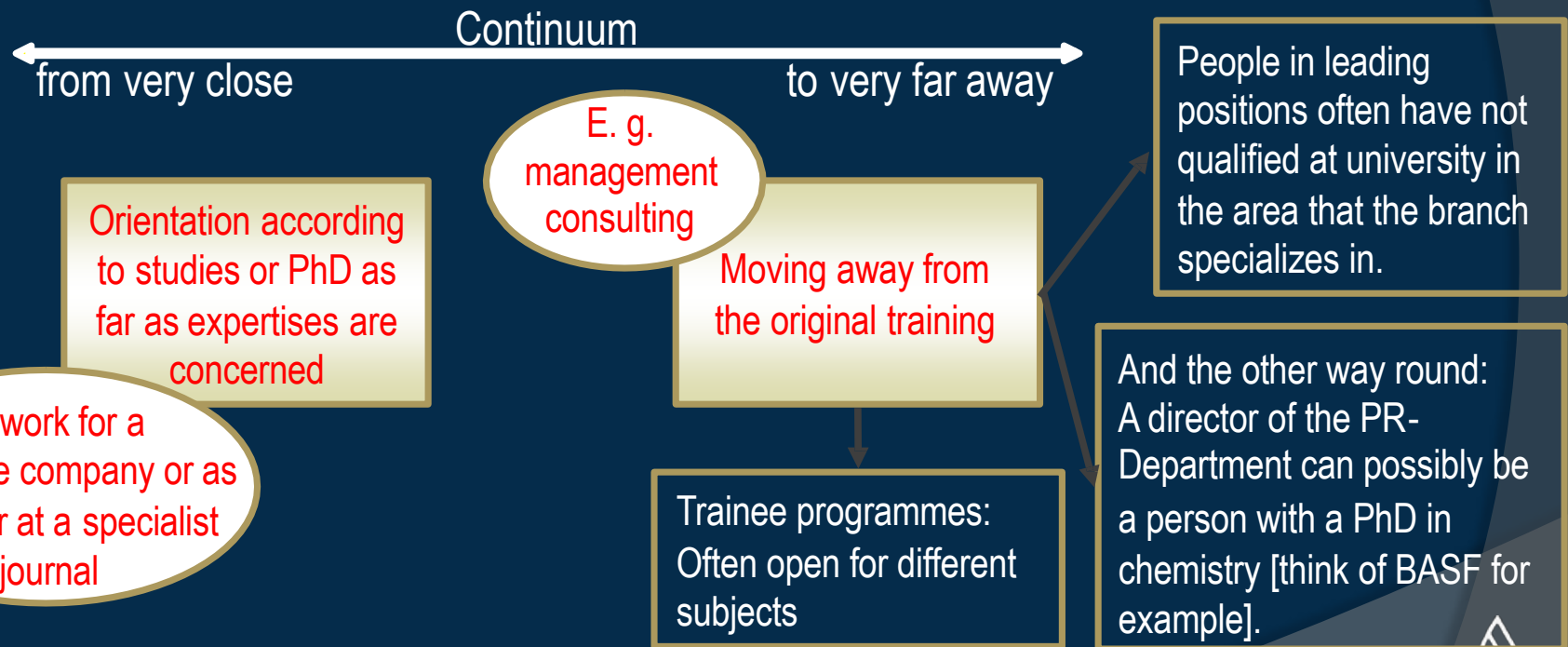
## Services

- > Local state departments
- > Federal state departments
- > Economic and business consulting
- > Consulting engineers
- > Trade
- > Patent matters
- > Organisations and associations
- > Planetariums
- > Observatories
- > Museums
- > Media/publishers
- > Libraries



# Exit strategy: Employment outside research

## Relationship training – working life



# Exit strategy:

## Where do I find information?

### Content-based research



# Moving to industry

“We want to find someone who’s charged up with enthusiasm to work for our company. So don’t do three postdocs, not find an academic job, and then apply here.”

Jim Hollenhorst  
Agilent’s senior director of technology



# Again: why a postdoc?

- ◉ Career in academia: requirement
- ◉ Uncertain: one postdoc does not damage (increase contacts, recommendation possibilities and horizons)
- ◉ Industry: directly after PhD or after a 1<sup>st</sup> postdoc



# References

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- Life outside the lab: the ones who got away – Callaway Nat 513, 20 (2014) –  
<http://dx.doi.org/10.1038/513020a>





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Danke!