Women in computer science: Do we still need equality measures?

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Vienna
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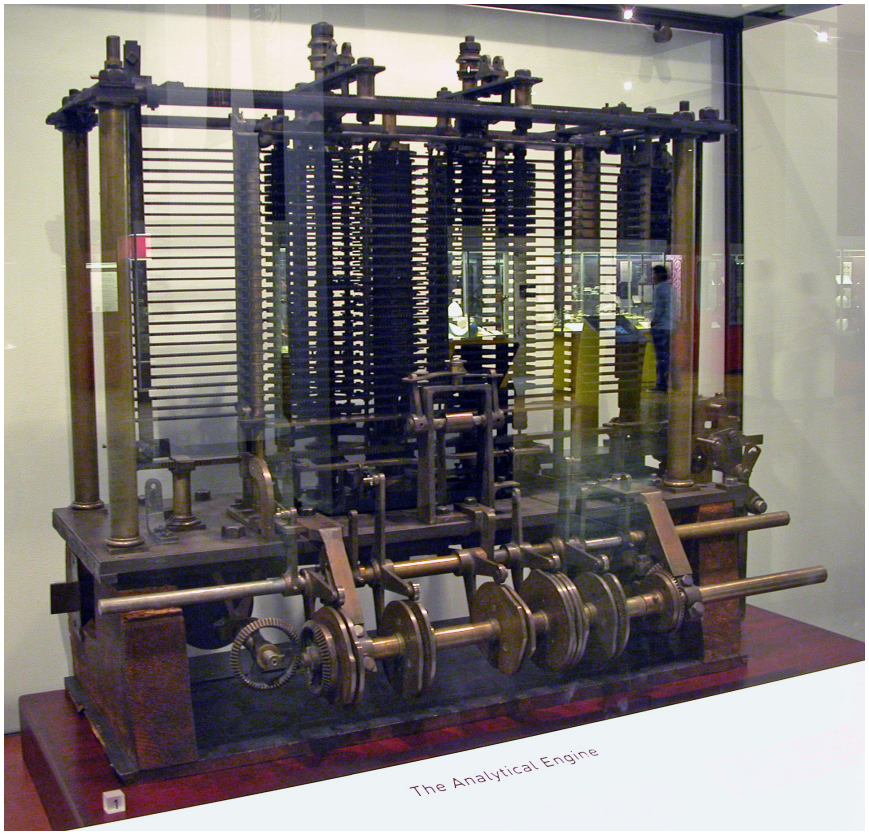
1 Women in computer science

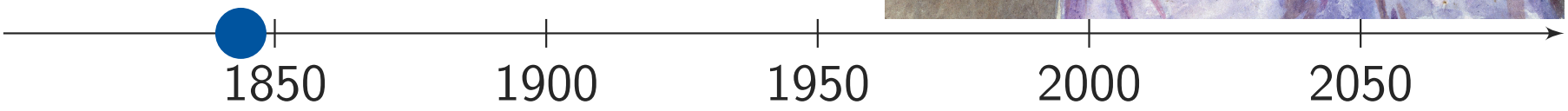
2 Do we still need equality measures?

3 Die WIRE working group

Women in computer science

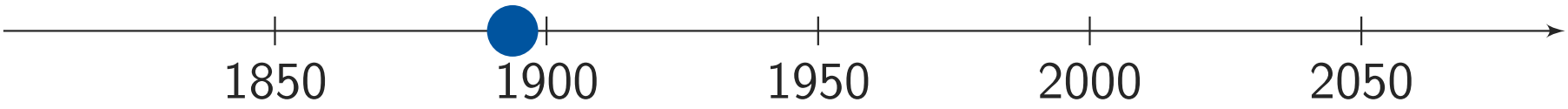


Ada Lovelace: algorithm for computing Bernoulli numbers on the Analytical Engine of Charles Babbage.



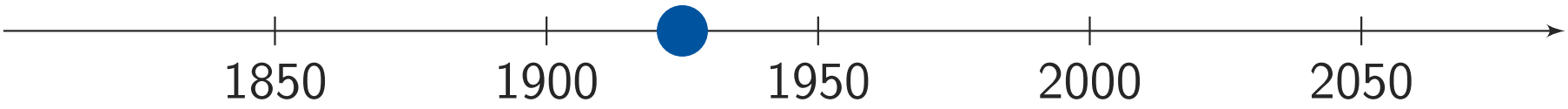
Women in computer science

Harward Computers: Edward Charles Pickering employed more than 80 women for measurements and computations in astronomy.



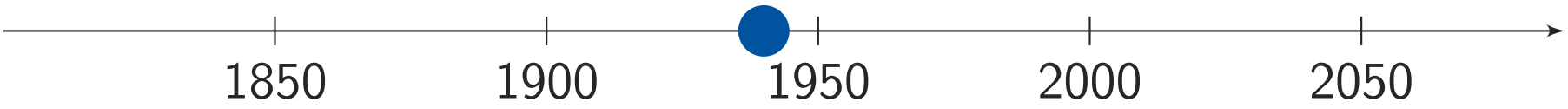
Women in computer science

Grete Hermann: ground-breaking dissertation in computer algebra (PhD mother Emmy Noether); teaching qualifications for secondary schools.



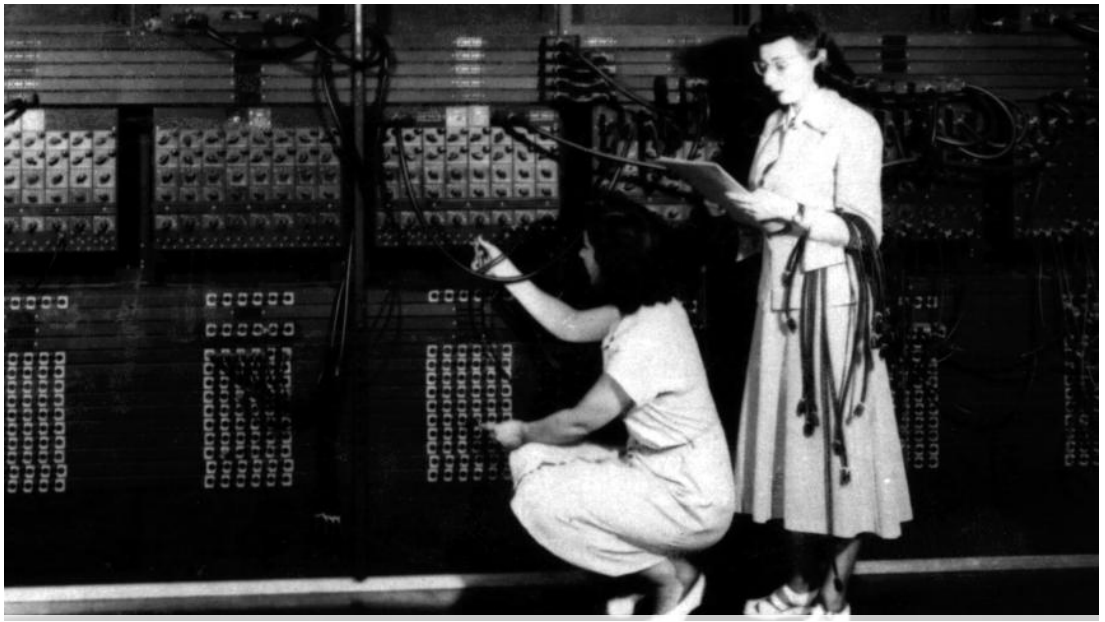
Women in computer science

Gertrude Blanch: pioneer in numerical mathematics and scientific computing; 1938-1948 director in the project *Mathematical Tables* of the U.S. government.

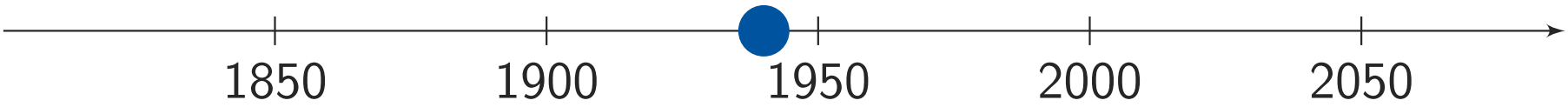


Women in computer science

During the second world war, programming has been done mostly by women; in the 60s still 30-50 precentage female programmers.



Though 6 women made significant contributions to the programming of ENIAC, only man have been acknowledged 1946 by its presentation. The 6 involved female programmers have been priced 1997, more than 50 years later.

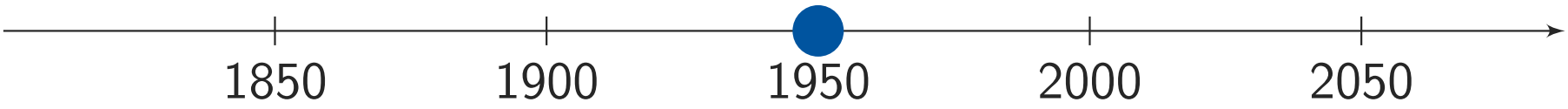


Women in computer science

After the 2nd world war, influential scientific positions have been awarded to men. Women were still welcome as lecturers, but not as researchers.

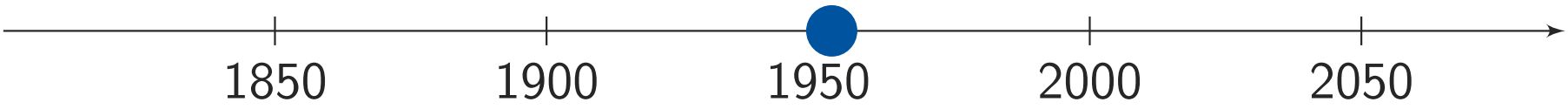
In Germany, less female STEM PhDs in the 60s than in the 20s and 30s.

At the beginning of the new era of computer science, women were not well visible, but they have been involved to a great extent.



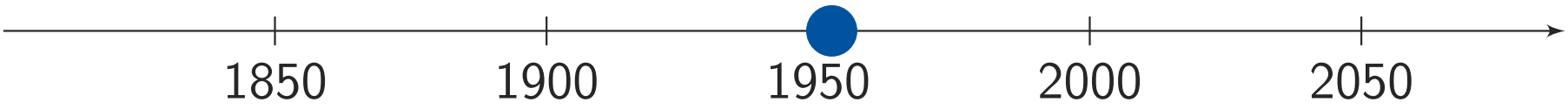
Women in computer science

Grace Hopper: developed the first compiler, prepared the way to the programming language COBOL.



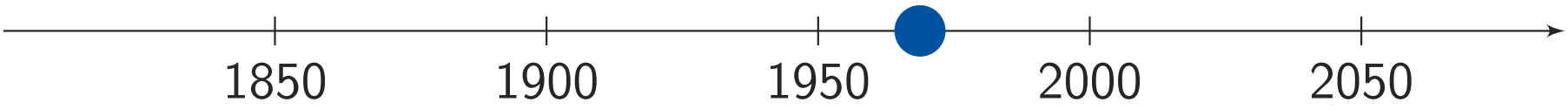
Women in computer science

Rózsa Péter: milestones for theoretical computer science; first women receiving the doctor's degree in mathematics in Hungary for her work on recursive functions.



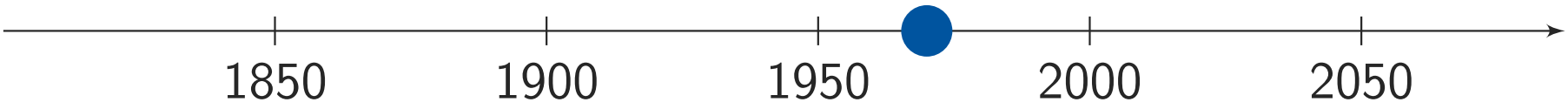
Women in computer science

Jean E. Sammet: published 1969 “Programming languages: history and fundamentals”, today a definite book on programming; first female president of the ACM (1972-1974).



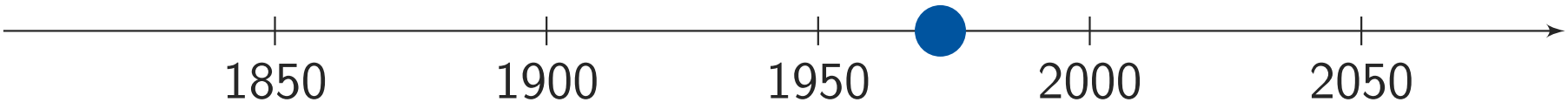
Women in computer science

As a reaction to the software crisis, in the 60s the first computer science study courses started in Germany.



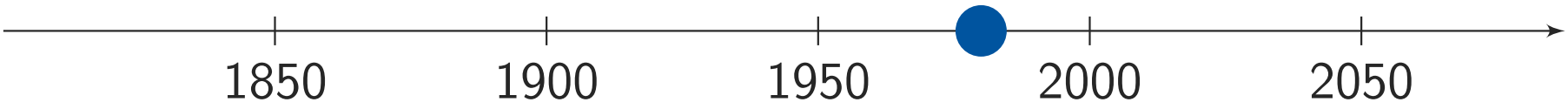
Women in computer science

Nancy Lynch: pioneer in distributed computing and distributed systems.



Women in computer science

Adele Goldberg: leader of the development team of Smalltalk, bringing up object-oriented programming languages; ACM president 1984-1986.



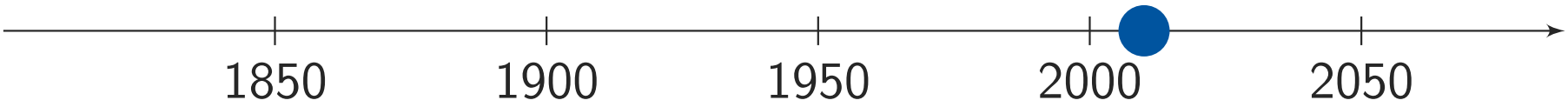
Women in computer science

2006
Francis Elizabeth Allen

2008
Barbara Liskov

2012
Shafi Goldwasser

3 women received the Turing Award (out of 67 persons 1966-2017)



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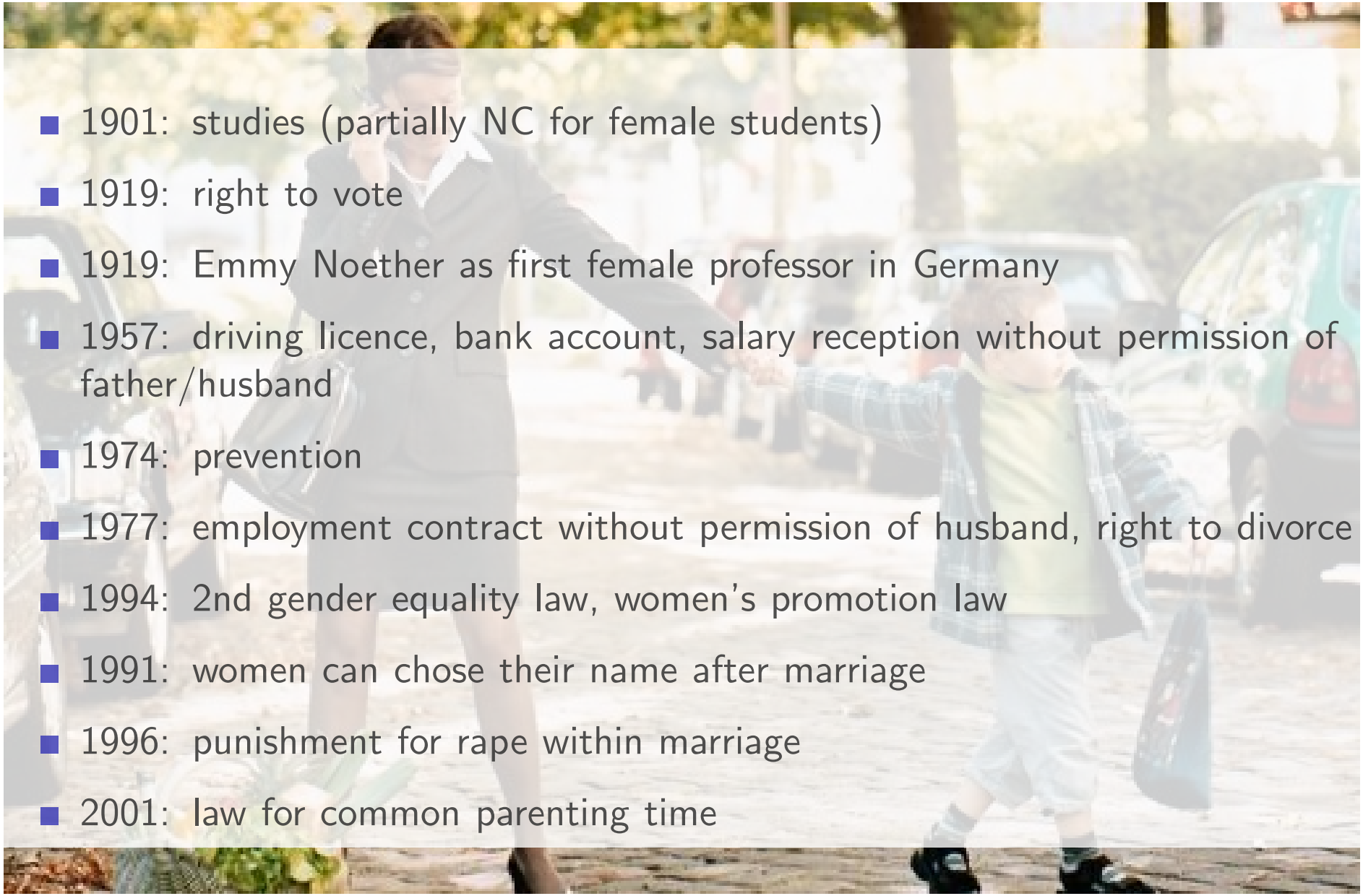
Women's rights in the 20th century in Germany



- 1901: studies (partially NC for female students)
- 1919: right to vote
- 1919: Emmy Noether as first female professor in Germany
- 1957: driving licence, bank account, salary reception without permission of father/husband
- 1974: prevention
- 1977: employment contract without permission of husband, right to divorce
- 1994: 2nd gender equality law, women's promotion law
- 1991: women can chose their name after marriage
- 1996: punishment for rape within marriage
- 2001: law for common parenting time

Cultural change ist complex and often uncomfortable.

Women as colleagues

- 2016 interview with 200 female employees in IT start-ups [Innofact institute].
- More than 50% reported harassment in the last year, 30% unwanted body contact.
- These values are much higher than in other domains.

DER TAGESSPIEGEL

Brief eines Google-Mitarbeiters

08.08.2017 09:08 Uhr

Die Tech-Branche und ihr Sexismusproblem

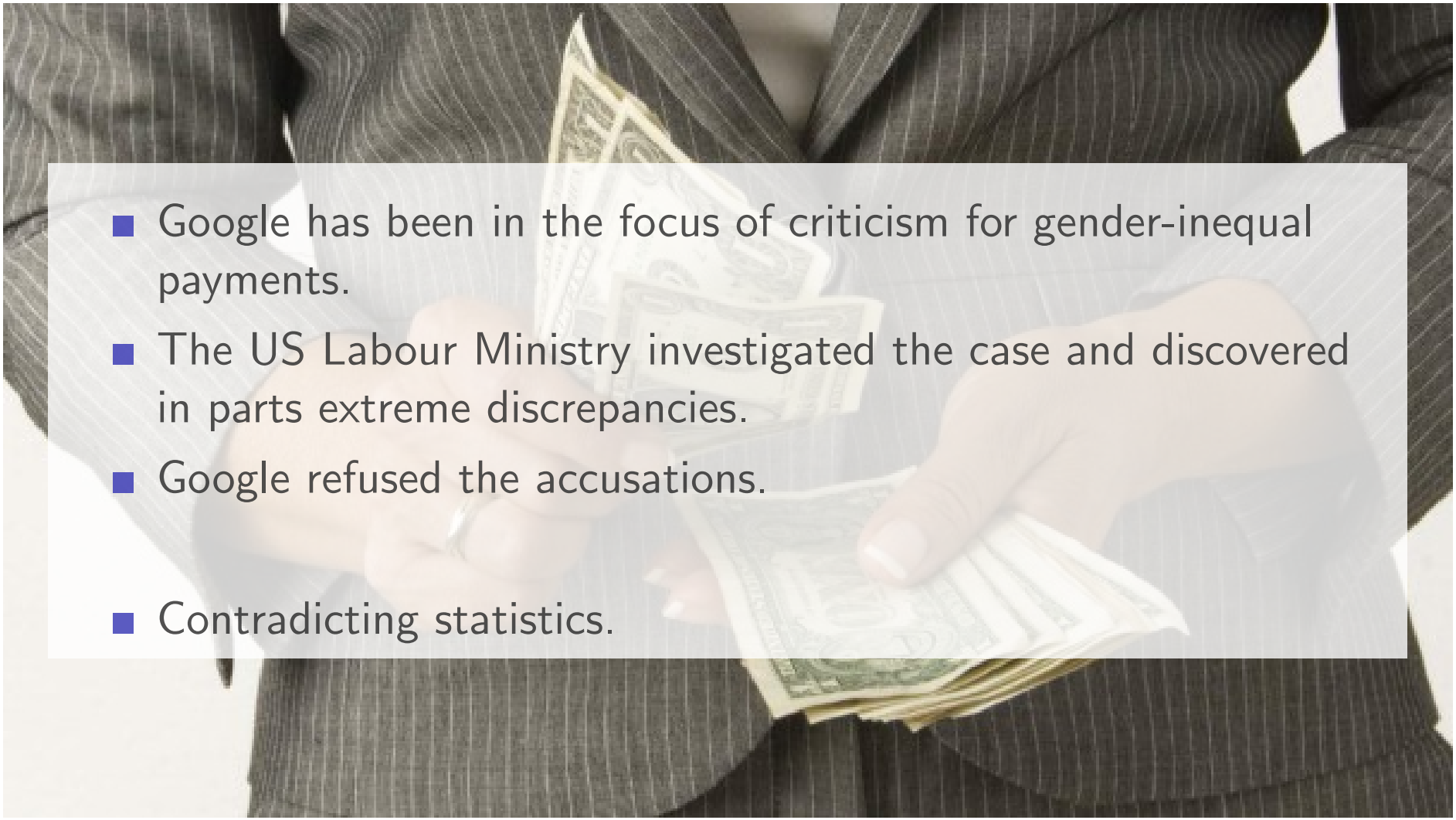
Der sexistische Brief eines Google-Mitarbeiters befeuert die Debatte über fehlende Frauen in der Technologiebranche. Dabei galt Informatik einst als Frauensache. VON OLIVER VOSS

- A Google employee stated in an open letter that women are biologically less suited for professions in technology.
- Women are less resistant to stress and should not get therefore into leading positions. The attempt to bring more women into the IT sector is a mistake - but it is not allowed to speak it out.

- Agreement from a part of the employees.
- Does this fall under freedom of opinion?...

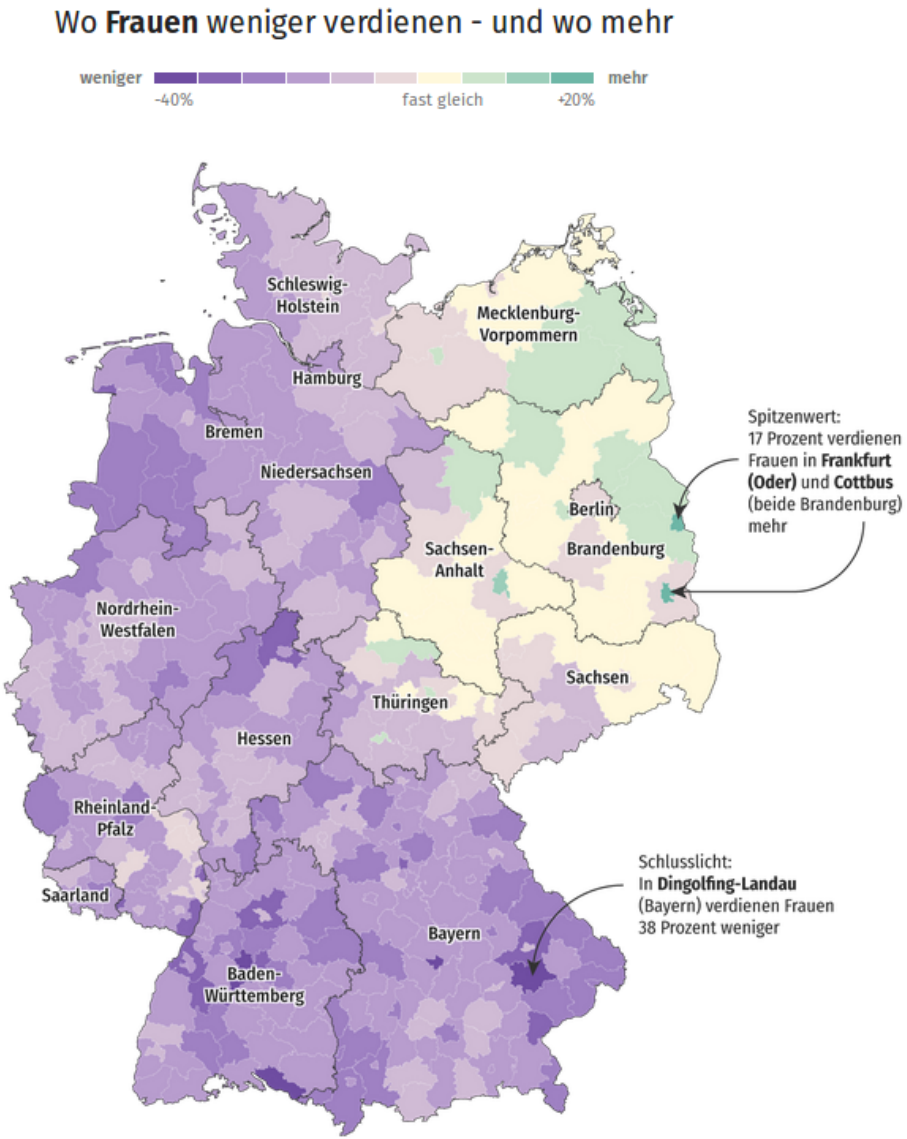
  Google terminated the contract with the employee.

Women as workforce



- Google has been in the focus of criticism for gender-inequal payments.
- The US Labour Ministry investigated the case and discovered in parts extreme discrepancies.
- Google refused the accusations.

- Contradicting statistics.



Technische Forschung und Entwicklung	**-9 %** -488€
Geschäftsführung und Vorstand	**-9 %** -492€
Gesetzgeb. Körperschaften, Bedienstete v. Interessenorg.	**-10 %** -521€
IT-Systemanalyse, Anwenderber, IT-Vertrieb	**-17 %** -928€
Mathematik und Statistik	**-18 %** -978€
Pharmazie	**-46 %** -2464€
Rechtsberatung, -sprechung und -ordnung	**-50 %** -2707€

Source: Bundesagentur für Arbeit 2016

Problems with offspring

- 59,000 unfilled IT positions and
  478,300 unfilled STEM positions
  in April 2019 in Germany.
- We need the potential of women in computer science and STEM!

Support and enthuse

- Komm mach MINT (BMBF, 3.000.000 EUR per year, more than 1000 offers for girls and young women)
- Sommer university Informatica Feminale
- Girls' day
- ACM-WE womENcourage
- ...

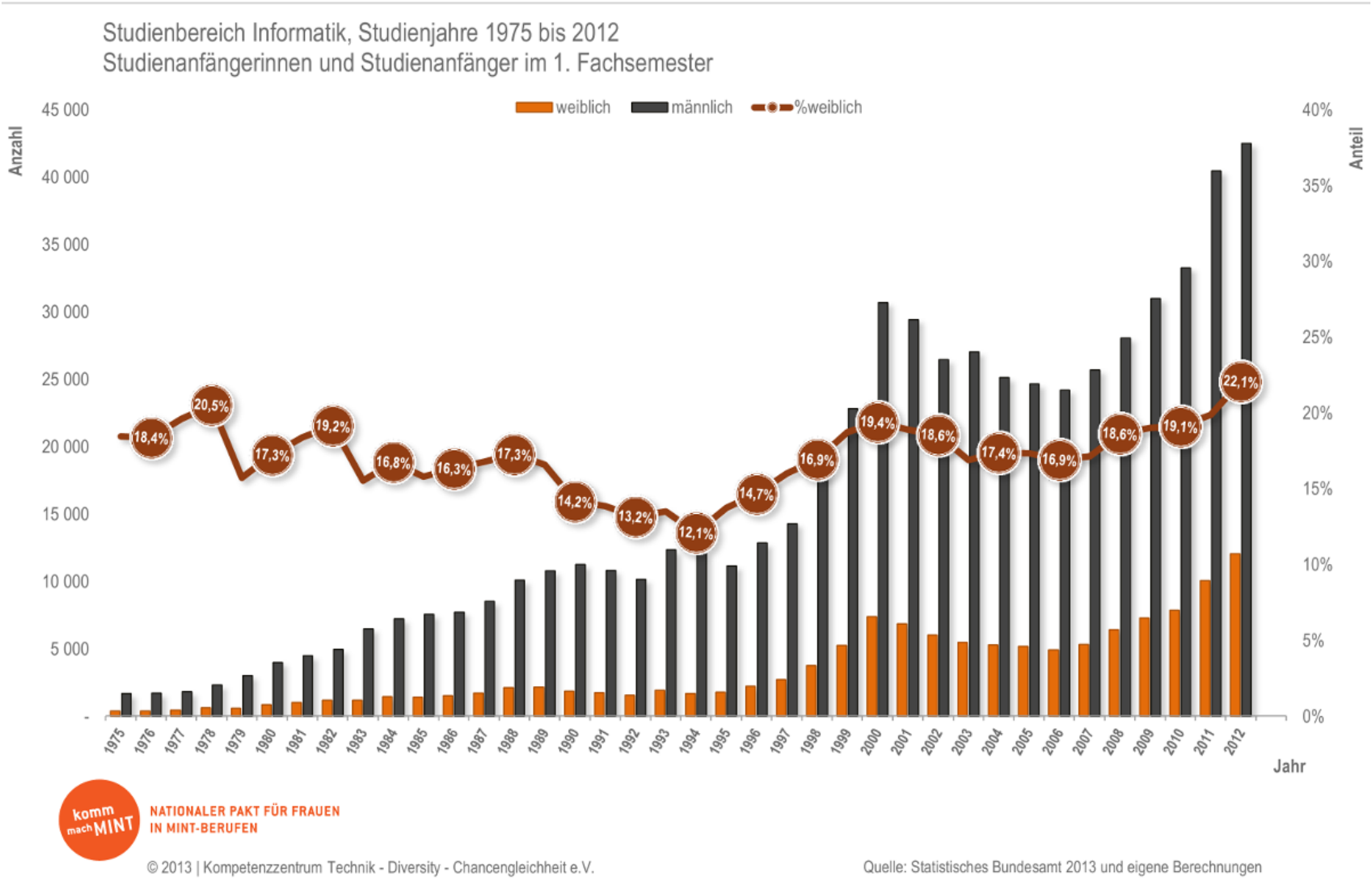
Successful?

Informatics-interested in high schools: boys 6%, girls 0.5%

Reasons: still not clear

- Traditional role allocations?
- Influence of parents?
- Influence of teachers?
- Missing role models?
- General differences in interest?
- Raise of PCs?
- Image of nerd culture?
- Wrong information about contents?

Computer science enrollment 1st semester



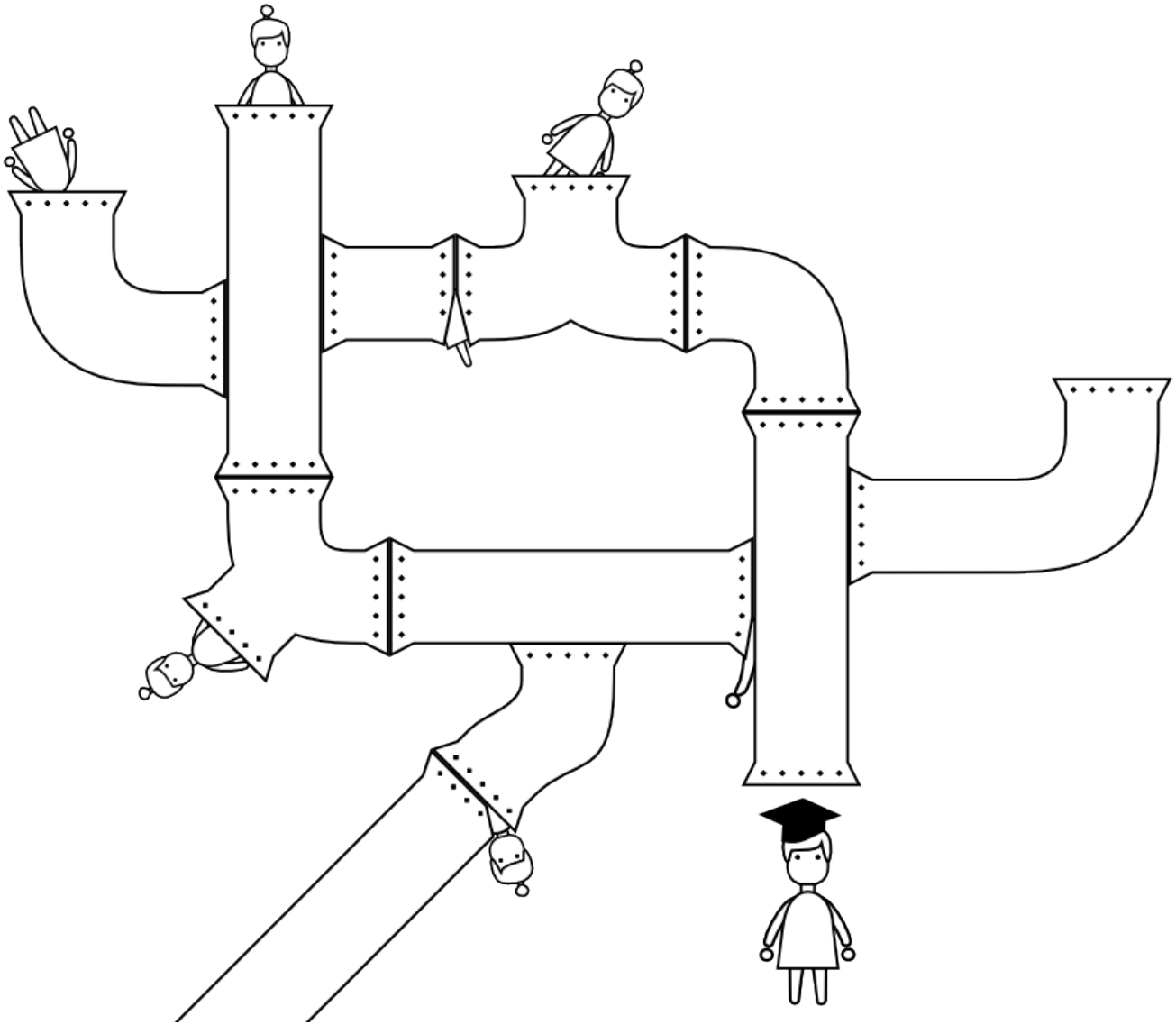
Source: `https://www.herr-rau.de/wordpress/2014/11/frauenanteil-in-der-informatik.htm`

Geographisches Gebiet	Frauenanteil 2003	Frauenanteil 2012	Relativer Frauenanteil 2012 zu 2003
Belgien	8,88 %	6,44 %	72,50 %
Bulgarien	48,71 %	39,03 %	80,13 %
Deutschland	15,09 %	17,05 %	113,01 %
Estland	27,22 %	22,32 %	81,99 %
Europäische Union (27 Länder)	22,73 %	16,79 %	73,86 %
Europäische Union (28 Länder)	22,75 %	16,83 %	73,96 %
Euroraum (17 Länder)	21,52 %	16,71 %	77,65 %
Euroraum (18 Länder)	21,58 %	16,72 %	77,46 %
Finnland	42,38 %	22,79 %	53,78 %
Lettland	25,88 %	17,66 %	68,24 %
Litauen	34,01 %	18,73 %	55,08 %
Malta	6,67 %	37,36 %	560,44 %
Niederlande	14,69 %	13,29 %	90,49 %
Norwegen	20,23 %	13,26 %	65,56 %
Österreich	9,47 %	15,01 %	158,59 %
Polen	17,62 %	10,96 %	62,21 %
Portugal	36,05 %	20,09 %	55,72 %
Schweiz	6,38 %	6,44 %	100,96 %
Slowenien	4,92 %	13,35 %	271,39 %
Spanien	21,93 %	15,87 %	72,38 %
Türkei	24,68 %	29,42 %	119,20 %
Tschechische Republik	15,16 %	11,30 %	74,50 %
Ungarn	21,58 %	16,80 %	77,87 %

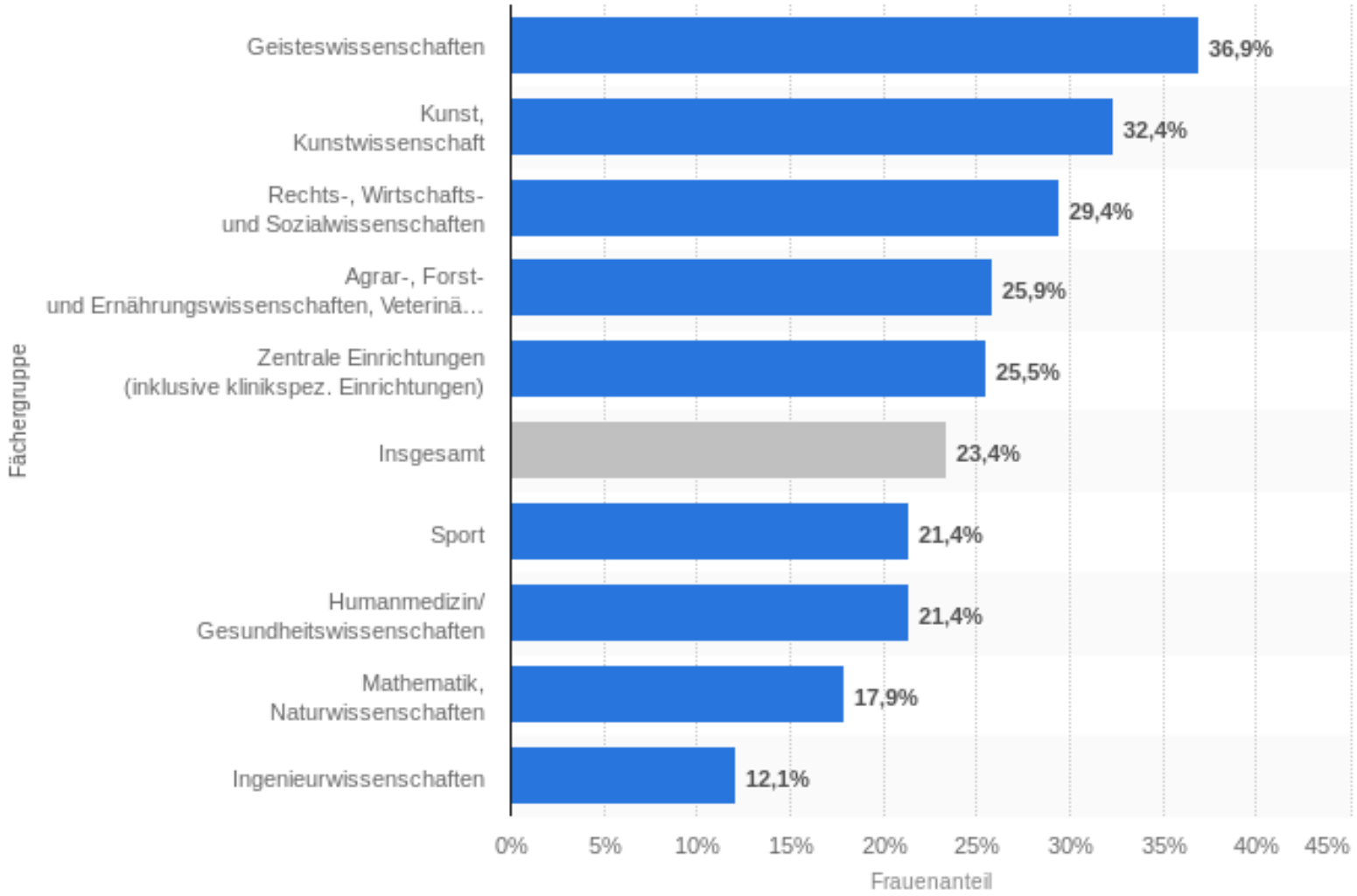
Quelle: Eurostat[1]

Share of women in computer science studies in Germany

The leaky pipeline



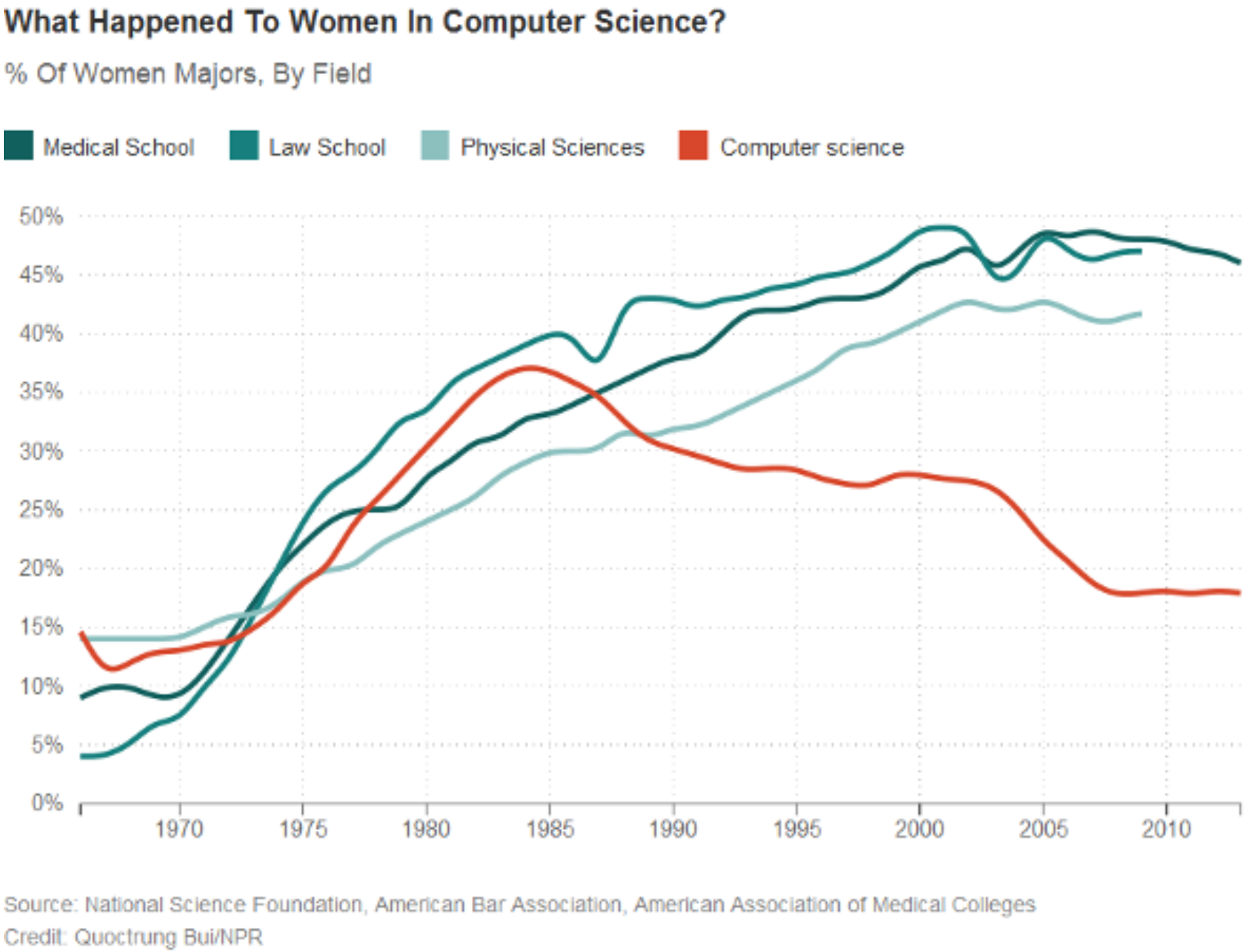
Share of women at the level of professors in Germany 2016



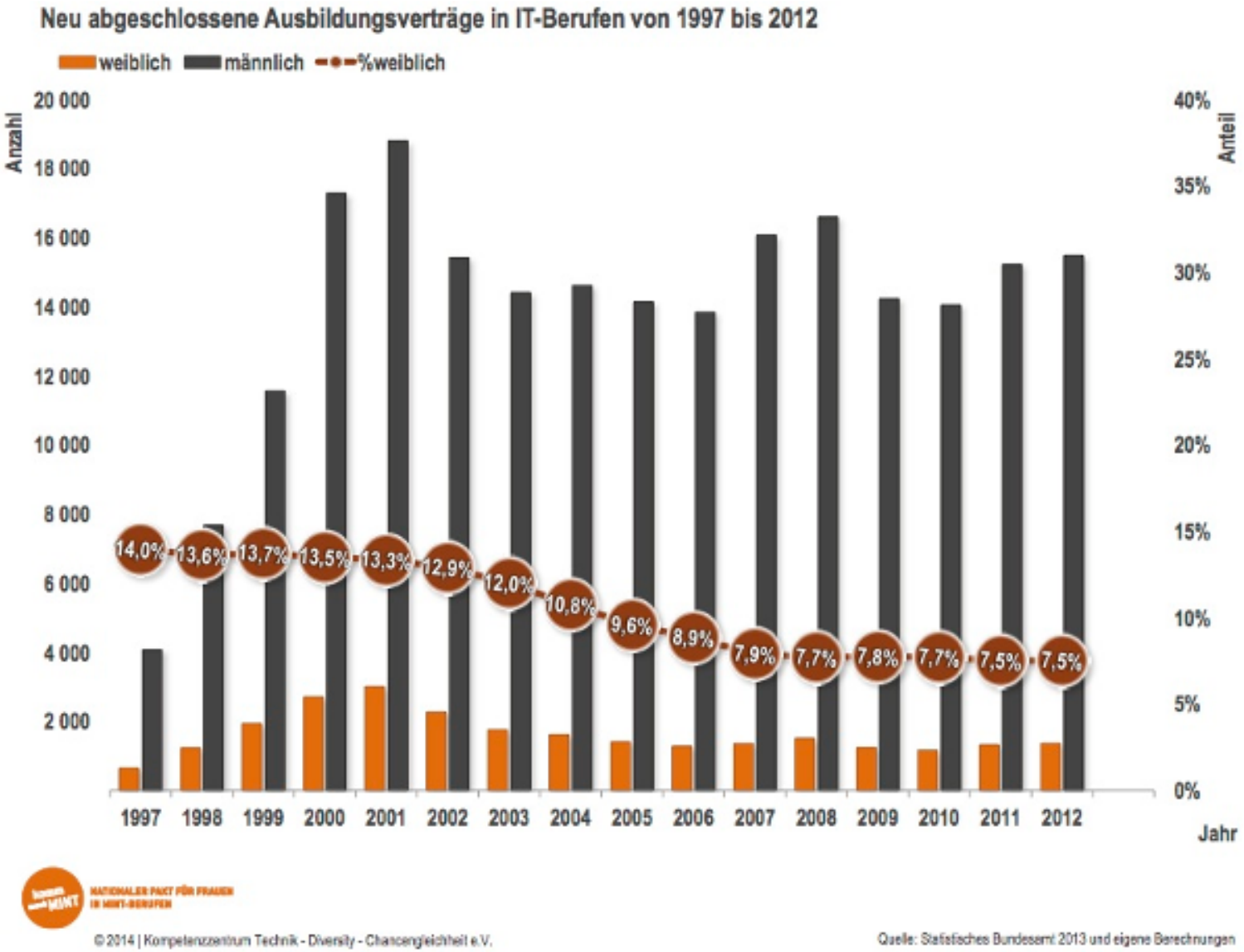
Computer Science: 112 female vs 957 male professors ($\approx$ 10.4%)

Source: Statista, Informatica Feminale

How is it in the USA?



IT training contracts



Source: `https://www.herr-rau.de/wordpress/2014/11/frauenanteil-in-der-informatik.htm`

Quota?

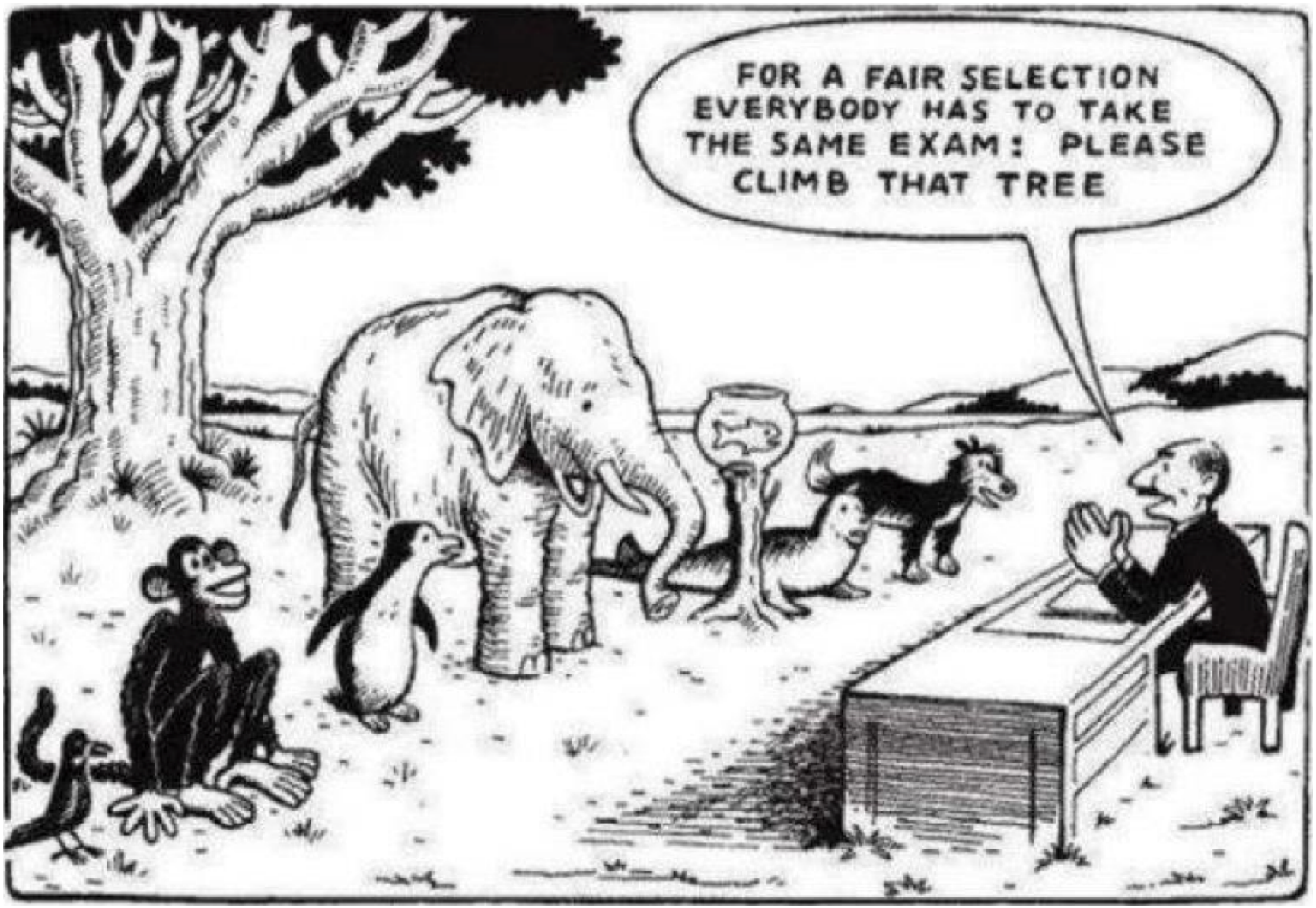
Academic policies for gender equality:

- equal opportunities plans
- equal opportunities officers
- family services
- dual-carrier-services
- mentoring programme
- ...

It helps, but it it not satisfactory.

- Proposed 2006 by Ernst-Ludwig Winnacker, president of the university rectors' conference
- Equal percentage not realistic $\rightarrow$ cascade model
- Leads to the general suspicion of "token women"

Where is the problem?



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Informatics Europe and WIRE

Informatics Europe

- Prepresents the academic Informatics community in Europe and neighboured countries
- Around 140 university departments and research institutes from over 30 countries are members
- Supports, forms and stimulates research, teaching and knowledge transfer in Informatics in Europe

Women in Informatics Research and Education (WIRE)

- WIRE is a working group of Informatics Europe
- Aim: support and coordination of measures to increase the percentage of women in Informatics at all carrier stages

WIRE activities

- Booklet More Women in Informatics Research and Education
- Annual Minerva Informatics Equality Award
- European platforms for communication and exchange of actors for equality in computer science
- Measures to increase the visibility of the women who are there
- Support of the womENcourage conference series
- Interviews, publications usw.

WIRE booklet

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Call Open for 2018 Minerva Informatics Equality Award

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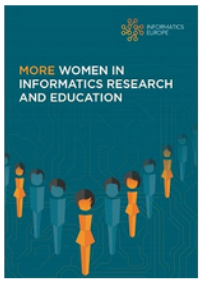
More Women in Informatics Research and Education



Now in its second edition, this compact resource is published by the Informatics Europe Working Group "Women in Informatics Research and Education" and endorsed by the European Commission. It provides deans and department heads clear and simple best practices to increase the participation of women in their institutions, both as students and as employees. Many tips were gathered directly from colleagues in leading academic positions who have successfully implemented actions that attract and retain more women in their organisation.

Details Download

more-women-in-informatics-research-and-education_2016.pdf

Join us

WIRE booklet

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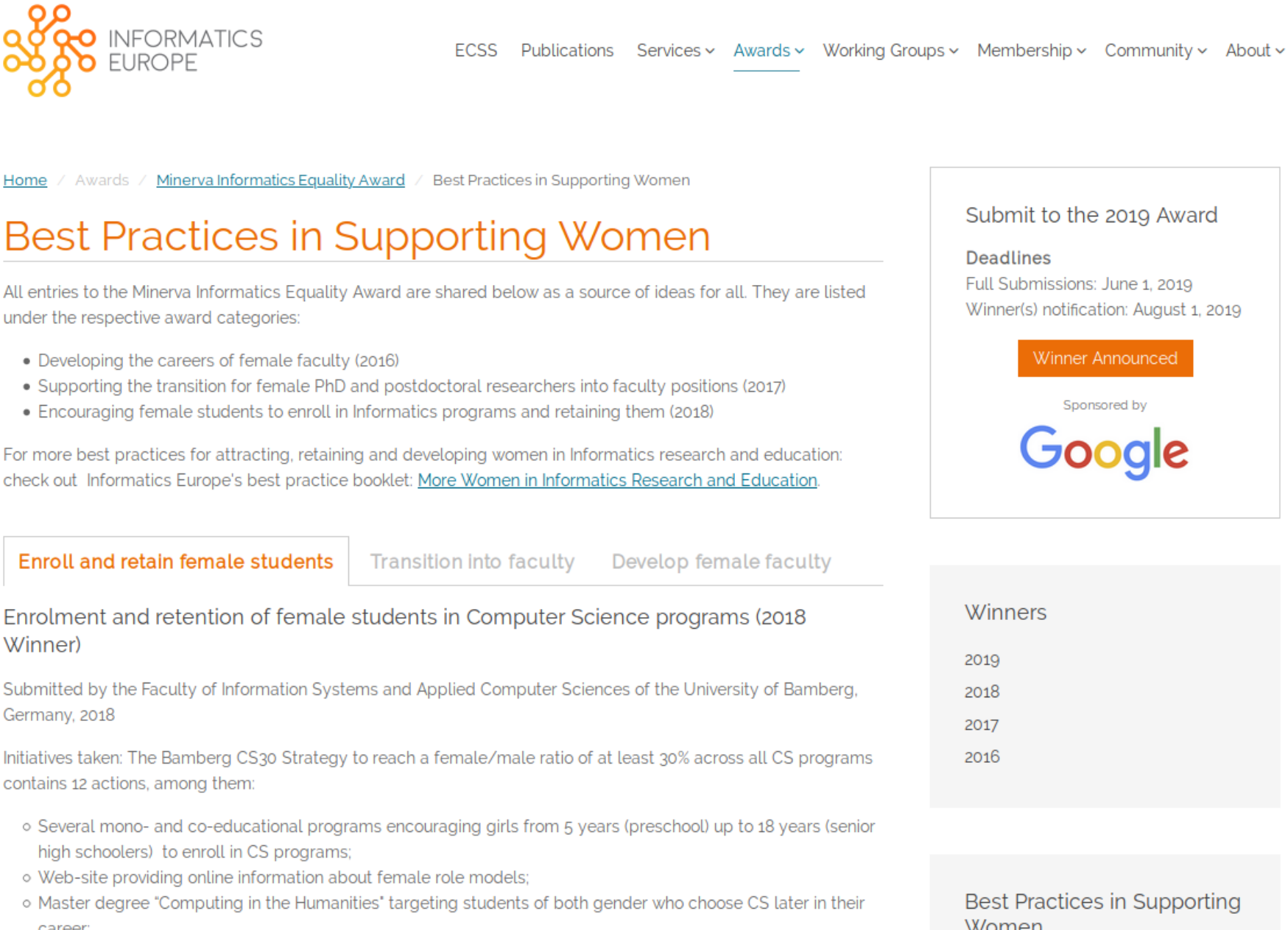
From "Keeping women":

- Provide support for the creation of a women's network within the department/institute, including secretarial support and a budget for holding events such as lunches.
- Distribute welcome packages with a booklet that lists childcare options as well as other useful info provided by faculty/institute members.
- Hold annual discussions with representatives of the women's network and the head of the HR department.
- Encourage senior members of staff in the department to act as mentors. This will create a community where knowledge is passed on to new members, keeping women interested in the department/organisation and in the field.
- Count the hours spent on female support and network issues in the same way as all other departmental commitments and duties. Do not assume that female employees can deal with this extra load in their "spare" time.

Minerva Informatics Equality Award

- First issued 2016
- Recognises best practices in departments or faculties of European universities and research labs that encourage and support the careers of women in Informatics research and education
- On a three-year cycle, the award focuses each year on a different stage of the career pipeline:
  - Encouraging female students to enroll in Computer Science/Informatics programmes and retaining them
  - Supporting the transition for PhD and postdoctoral researchers into faculty positions
  - Developing the careers of female faculty
- `http://www.informatics-europe.org/awards/minerva-informatics-equality-award.html`

Minerva Informatics Equality Award



The WIRE Workshop

ECSS Home / Program / WIRE Workshop

WIRE Workshop 2019

"The Computer Science Career Journey - Opportunities and Challenges for Women"

The Informatics Europe working group on Women in Informatics Research and Education (WIRE) organised a full-day workshop on **28 October (Monday)**, as part of the ECSS 2019 program. The purpose of WIRE is to promote actions that help improve gender balance at all stages of the career path in Informatics (Computer Science, Computing) in Europe.

The main goal of the workshop was to foster a European network of colleagues working at the university and country level on the issue of gender unbalance in Informatics.

More specific aims of the workshop were:

- To increase the visibility of European WIRE-related activities
- To offer a place for exchange, especially experience reports for existing measures
- Bring forward the creation of a European network of actors; discuss contents, how we can support activities
- Strengthened networking; increased participation in our mailing list
- Advance the process for the creation of a list of female professors in Informatics (as candidate speakers, PC chairs/members, etc.)

The workshop was organised by Erika Abraham (RWTH Aachen University), Lejla Batina (Radboud University), Alexandra Silva (University College London) and Cristina Pereira (Informatics Europe) and

WIRE activities

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- Annual Minerva Informatics Equality Award
- European platforms for communication and exchange of actors for equality in computer science
- Measures to increase the visibility of the women who are there
- Support of the womENcourage conference series
- Interviews, publications usw.

Concluding thoughts

- Gender equality is young, still endangered and frail
- Gender equality is not only *women's thing*
- It needs special measures in the transition period
- Young women often do not see the necessity for these measures...

  ...but they are still of fundamental importance.