GenHET@CERN:

A proactive approach to Gender in Theoretical Physics

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Women in Nuclear and Hadron Theoretical Physics:
the last frontier - WTPLF 2018
Genoa, 10th December, 2018

Goals

- **Discuss gender dynamics** in Theoretical Physics from the point of view of an insider (a scientist, not a sociologist,...)

- **Announce** a new permanent Working Group hosted and partially supported by CERN-TH

- History: COST-MP1210 **"The String Theory Universe"**, an initiative proposed and coordinated by EU women working in String Theory, with multiple goals (**science, social engagement, $$$**)

- **Share** what we have learned, discuss how to go on, possibly inspire you

https://indico.cern.ch/event/714346/overview

26-28 September 2018: Kick-off of Gen-HET 1st Workshop on High Energy Theory and Gender

MEETINGS

Theory event fuses physics and gender

CERN hosted its first workshop on high-energy theory and gender on 26–28 September. It was the first activity of the "Gen-HET" working group, whose goals are to improve the presence and visibility of women in the field of high-energy theory and increase awareness of gender issues (see p5).

Most of the talks in the workshop were on physics. Invited talks spanned the whole of high-energy-theory, providing an opportunity for participants to learn about new results in neighbouring research areas at this interesting time for the field. Topics ranged from the anti-de-Sitter/conformal field theory (AdS/CFT) correspondence and inflationary cosmology to heavy-ion, neutrino and beyond-Standard Model physics.

Agnese Bissi (Uppsala University, Sweden) began the physics programme by reviewing the now-two-decades-old AdS/CFT correspondence, and discussing the use of conformal bootstrap methods in holography. Korinna Zapp (LIP, Lisbon, Portugal and CERN) then put three recent

CERN-PHOTO-201809-248-8

Some of the participants at the first workshop on high-energy theory and gender.

- 90 participants, 11 review talks, 7 short talks by young researchers

Physics talks - confirmed speakers:

- **Ana Achucarro** (Leiden U.) - Inflation
- **Agnese Bissi** (Uppsala U.) - AdS/CFT correspondence
- **Alejandra Castro** (Amsterdam U.) - Black hole entropy
- **Laura Covi** (Goettingen U.) - Cosmology
- **JiJi Fan** (Brown U.) - BSM Phenomenology
- **Elvira Gamiz** (Granada U.) - Lattice QCD & flavour physics
- **Silvia Pascoli** (Durham U.) - Neutrino Physics
- **Tracy Slatyer** (MIT) - Dark Matter
- **Maria Ubiali** (Cambridge U., DAMTP) - Parton distributions from high precision collider data
- **Eleni Vryonidou** (CERN) - SM Effective Field Theory
- **Korinna Zapp** (LIP, Lisbon & CERN) - Heavy Ion Physics

6 talks by gender experts+ discussion sessions

-Gender initiatives at CERN
-Understanding young women's science aspirations
-Gender in academic recruitment and selection
-Unconscious bias and what can we do about it?
-On the road to equality at Imperial College

Gender talks - confirmed speakers:

- **Marieke van den Brink** (Nijmegen U.)
- **Meytal Eran-Jona** (Weizmann Inst.)
- **Julie Moote** (UCL, London)
- **Yosef Nir** (Weizmann Inst.)
- **Jessica Wade** (Imperial College London)
- **Geneviève Guinot** (CERN Diversity Office)

GenHET: Gender in High Energy Theory

- A permanent Working Group based in the EU community of High Energy Theoretical Physics, aimed at addressing the problem of the low percentage of women in this research field.

- Born as a follow up of the gender activities organised within the COST Action MP1210 "The String Theory Universe", it has now grown to include the whole community of Theoretical High Energy Physics.

- Hosted (and supported in part) by the CERN Theory Department,

GenHET aims to

- Increase awareness of gender issues
- Improve the visibility and presence of women in HET
- Provide networking, support and mentoring for women, particularly early career women
- Increase the representation of women as speakers in conferences, in organising committees, as editors of leading journals and more generally in decision making roles throughout the community
- Creating a web site on Gender and Diversity in Physics

Viewpoint

Fixing gender in theory

It is high time we addressed the low representation of women in high-energy theoretical physics.

iStockphoto/Bulat Silvia

Less than 10% of string theorists are female, part of a broader problem that a new initiative called GenHET aims to tackle.

By Marika Taylor

Improving the participation of under-represented groups in science is not just the right thing to do morally. Science benefits from a community that approaches problems in a variety of different ways, and there is evidence that teams with mixed perspectives

In 2012, a group of string theorists in Europe launched a COST (European Cooperation in Science and Technology) action with a focus on gender in high-energy theory. Less than 10% of string theorists are female, and, worryingly, postdoc-application data in Europe show that the percentage of female early-career researchers has not changed significantly over the past 15 years.

The COST initiative enabled qualitative surveys and the collection of quantitative data. We found some evidence that women PhD students are less likely to continue onto postdoctoral positions than male ones, although further data are needed to confirm this point. The data also indicate that the percentage of women at senior levels (e.g. heads of institutes) is extremely low, less than 5%. Qualitative data raised issues specific to HET, including the need for mobility for many years before getting a permanent position and the long working hours, which are above average even for academics. A series of COST meetings also provided opportunities for women in string theory to network and to discuss the challenges that they face.

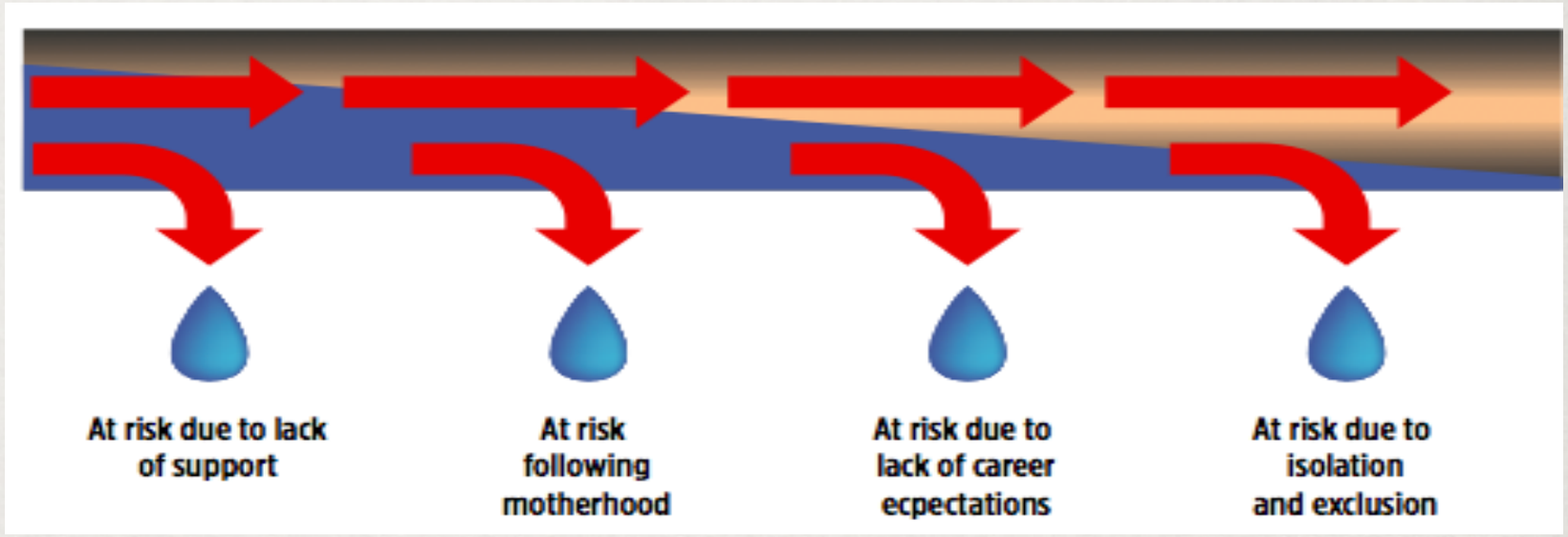
Following the conclusion of the COST action in 2017, women from the string theory community obtained support to continue the initiative, now broadened to the whole of the HET community. "GenHET" is a permanent working group hosted

Why Physics & Gender (SHE-Figures 2015, GENERA,...)

https://ec.europa.eu/research/swafs/index.cfm?pg=library&lib=gender_equality

- Low percentage of women (38% Master, 30% at PhD, 29% post docs, 20% junior faculty, in certain fields <10%)

- Leaking pipeline



- Glass ceiling (1/2 probability w.r.t. men to become Full Prof), gender gap

- Gender bias in selection committees (also for women)

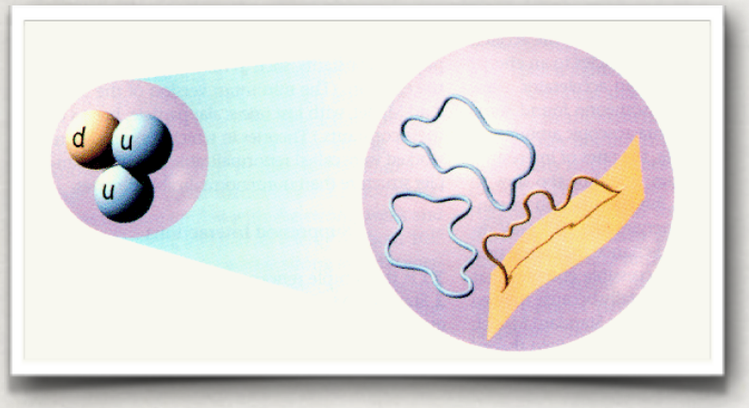
- Loss of talents (*"excellence is gender blind"*)

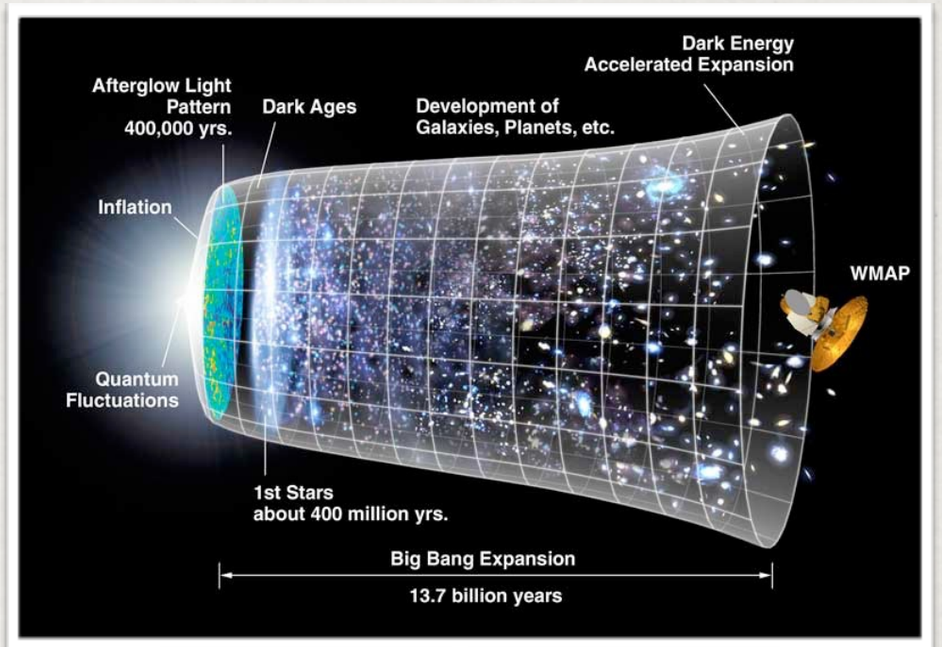
- Social imbalance: shortage of women in STEM

Gender dynamics in the String Theory milieu

Anna Ceresole — Genova 2018

TOPIC: String Theory —> Quantum Gravity





- Consistent scheme to describe mathematically the unification of Elementary Particles and General Relativity (today only 20% is really about strings)

- **Physical mathematics:** relevant progress both in **Physics** and pure **Math**

- **Container/laboratory** for new ideas and innovative techniques to solve major problems in fundamental physics

- *The COST Action has promoted fundamental research in Particle Physics, Cosmology and Condensed matter Physics*

Why gender/diversity/inclusiveness in Strings

- **String Theory is not a girl-thing:**
  - women are not well represented in decision making processes
  - women have more difficulties in accessing top positions

- **possible motivations:**

  very competitive and time-demanding field
  the post-doc period is long and uncertain
  hard to match with a family life
  often dual career problem

"The String Theory Universe"
(2013-2017)

MP-1210 Materials, Physics & Nanosciences

Financial support for NETWORKING and COOPERATION, not for research itself

Aim : coordinate European research on string theory by workshops, conferences, PhD schools, short/mid-term exchange visits

Website: www.cost.eu/domains_actions/mpns/Actions/MP1210

Structure of the Action (2013-2017)

- **Chair**: Prof. Silvia Penati, University of Milano Bicocca

- 27 **Partners**: Austria, Belgium, Bulgaria, Denmark, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Malta, Netherlands, Portugal, Romania, Slovenia, Spain, Sweden, Switzerland, UK, Turkey, Argentina, Australia, Chile, South Africa, United States

- **Organization**: Core Group (Chairs, WG leaders+vice leaders, Financial rapporteurs, Young Researchers rep, Job opportunity rep) and Management Committee (12 women out of 37 official members)

- **Structure**: organized in Working Groups (tot over 600 people)

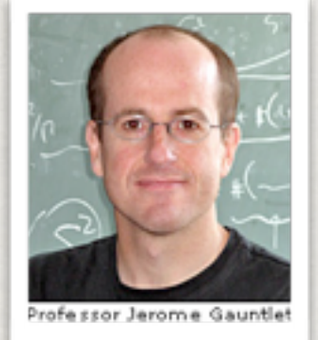
1: Gauge/Gravity duality
2: String Phenomenology
3: Cosmology and Quantum Gravity
4: Knowledge transfer
5: Gender issues and outreach

COST MP1210: an EU network 2013-2017

Silvia Penati
(U. Milano Bicocca
(CHAIR)

Yolanda Lozano
(U. Oviedo, Spain)
(Vice CHAIR)

M. Lledo
(U. Valencia, Spain)
(WG Leader)



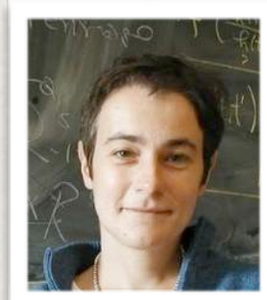
Jerome Gauntlett
(Imperial College, UK)
(WG Leader)

AC
(INFN, Italy)
(WG Leader)

Johanna Erdmenger
Max Planck, Germany)
(WG Leader)

R. Emparan
(U. Barcelona, Spain
(WG Leader)

G. Honecker
(U. Mainz)
Leader of Young Researchers



M. Petrini
(Paris VI)
(WG Leader)

e-COST

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| Actions | MP1210

cost
EUROPEAN COOPERATION
IN SCIENCE AND TECHNOLOGY

MPNS COST Action MP1210

The String Theory Universe

Descriptions are provided by the Actions directly via e-COST.

Although String Theory has been around for more than forty years, it has never been so important for physical reality as it is now, due to its novel outstanding applications to different areas of Physics and Mathematics.

While the Large Hadron Collider (LHC) narrows down the experimental limits on supersymmetric particles and satellite missions such as WMAP and PLANCK probe the very early Universe, this Action aims at creating a strong European Network focused on fundamental, forefront research exploring the role played by String Theory in Particle Physics, Cosmology and Condensed Matter Physics.

The large majority of European world experts in String Theory will be involved in this Action. This will ensure a top quality research output, achieved through an intense exchange of expertise, intra-European collaboration and co-organization of scientific activities.

The Action will ensure fair gender representation and simultaneously adopt specific measures for promoting the involvement of women scientists at all levels. Moreover, it will foster the active participation of junior excellent scientists.

The outcome of the Action is expected to have a positive impact on both science and society at a European level, in line with the strategic priorities of COST.

22 EU nations +USA, Australia, South Africa, Chile, Argentina ; over 600 scientists

Facts

The String Theory Universe was

- the first COST Action in Theoretical Physics
- the first to include a strong commitment towards gender issues

Actions about gender

- **outside** the string community
  - outreach activities in high schools
  - role model women scientists

- **inside** the string community
  - raise awareness on gender issues
  - monitoring
  - increase visibility and recognition of women in the field

Background

- idea of a group of mid-career women in string theories
- build on the tradition of networks and add a gender dimension
- the first proposal was drafted uniquely by women
- the whole community took part in drafting the final proposal

  the project has no gender bias

  strictly based on scientific excellence

- **main goals from the MoU:**

  —perform **frontier research** in String Theory, by exploiting and promoting complementary expertise of different groups in EU

  —foster **cooperation with other areas in Physics** to which String Theory has provided crucial applications

  —promote actions for **redressing gender imbalance** in the field

Increase visibility

- **High number of women** in the Action's management:
  the Chair, the vice-Chair and four out of the five working group leaders were women

- **Guarantee a fair representation** of women
  — in organising and scientific committees
  — as speakers
  for all conferences organised or funded by the action

Raise awareness

- Learn about relevant studies on gender participating into gender conferences (Gender Summit...)

- Bring gender to the attention of the whole community

  - **discussion sessions** led by women scientists and gender experts in all main events of the Action

  - **Workshops on String Theory and Gender** (Valencia 2015, Paris 2016 Southampton 2017)
    — scientists and gender experts meet
    — half string theory and half gender studies talks

Coup de théâtre :

a play (30 min, Milano final COST conference, February 2017

- by a professional writer based on episodes of micro-sexism experienced by women in the Action during their career
- confront our colleagues with typical experiences of women in their work environments.

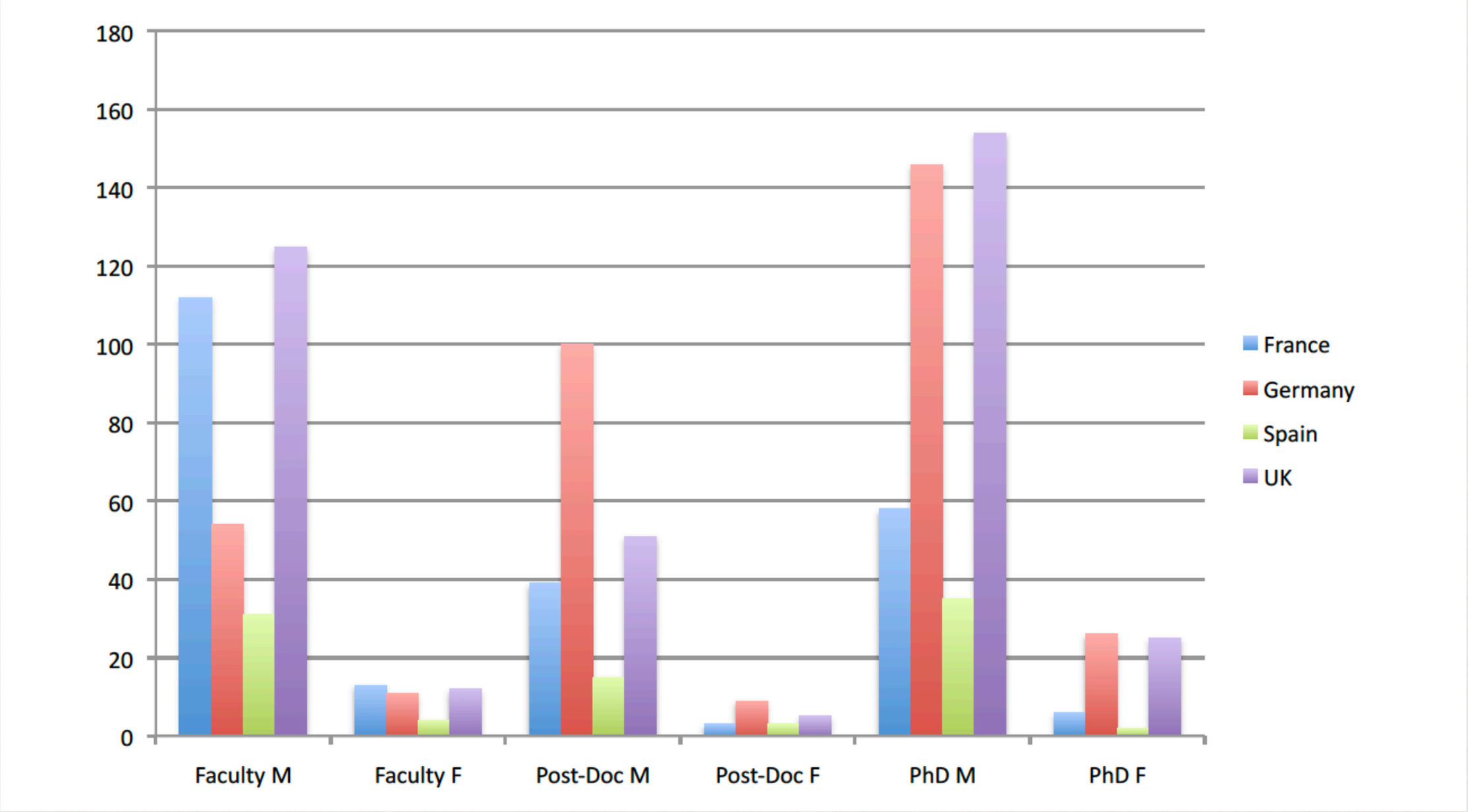
http://streaming.unimib.it/tcs/#page:recordingList&pageNumber:1&id:5EB39933-C031-4098-9C43-1F3572B532CD (starts minute 21)

Monitoring: post docs

- Post-doc recruitment in string theory for 15 years
  —tradition of European networks since the mid-eighties (Science, FP6, FP7)
  —a Joint Postdoctoral Recruitment process (coordinated by Leuven University): statistics on postdoctoral applications

  - percentage of women applicants stable around the 10%.
  - average rate of success of about 10%, slightly less for women, (with a high variability)

Monitoring: statistics



Statistics in hep-th and gr-qg for 2017
presented at String 2017 by M. Taylor

Monitoring: Gender Survey

Anonymous, online **survey i**n 2017 to test :

- the opinions on gender imbalance in the field,
- the possible measures that could be taken
- the impact of the various activities organized by the COST community.

• 172 participants (112 M, 50 W, 1 'other' and 9 'prefer not to say')

- Five groups of questions:
  - equal opportunities
  - family and caring responsibilities,
  - gender and work modalities,
  - gender within the COST Action
  - gender equality in the future

Please read our final report to have more info

Monitoring: gender survey

- Qualitative **results:**

  - the majority of the respondents were aware of gender inequalities in our field

  - men and women reported a different perception

    • women were more prone to agree that there is a problem concerning gender equality in their professional environments

    • women face difficulties about child care, frequent travel, relocations and so on, more often than men

Results after COST String Theory Universe

- The Action succeeded in raising awareness on the gender issues in a community that considered it a minor or private issue.
- It set a model for other Actions and grants to include gender issues among their goals.

Scientific output:

- About 2000 publications, 250 from MC members
- Support to conferences and schools (Cargese, Lisbon, GGI)
- About 60 publications related to 75 STSM
- Invited talks in international conferences worldwide
- About 10 ERC and other individual grants

Preparation for Phase 2:

What's next?

- Address more general questions
- Unconscious bias is still very strong
- Gender is a middle career thing
- Compare with other communities
- **Are quotas good?**
- Reach outside university: the problem starts at primary school
- Can women in power really propose an alternative model?

Comments

Sociology: a String conference in the 80'

Trieste, International Center for Theoretical Physics 1982

Some improvement 30 years later...

Strings 2012

Guidelines from Royal Society on unconscious bias

Action points

- When preparing for a committee meeting or interview, try to slow down the speed of your decision making.
- Reconsider the reasons for your decision, recognising that they may be post-hoc justifications.
- Question cultural stereotypes that seem truthful. Be open to seeing what is new and unfamiliar and increase your knowledge of other groups.
- Remember you are unlikely to be more fair and less prejudiced than the average person.
- You can detect unconscious bias more easily in others than in yourself so be prepared to call out bias when you see it.

Resources

Document sent to Italian panels by CUG INFN:
https://web.infn.it/CUG/images/alfresco/Cug/2016/2016-11-07-UnconsciousBias.pdf

Bibliography from Science Europe:
https://web.infn.it/CUG/images/alfresco/Risorse/ScienceEurope/ScienceEuropeGenderBias.pdf

2 minute video by Royal Society
https://royalsociety.org/topics-policy/publications/2015/unconscious-bias/

1) The web page of the first workshop GenHET
https://indico.cern.ch/event/714346/
and in particular the conference summary, the gender talks and the discussion topics.

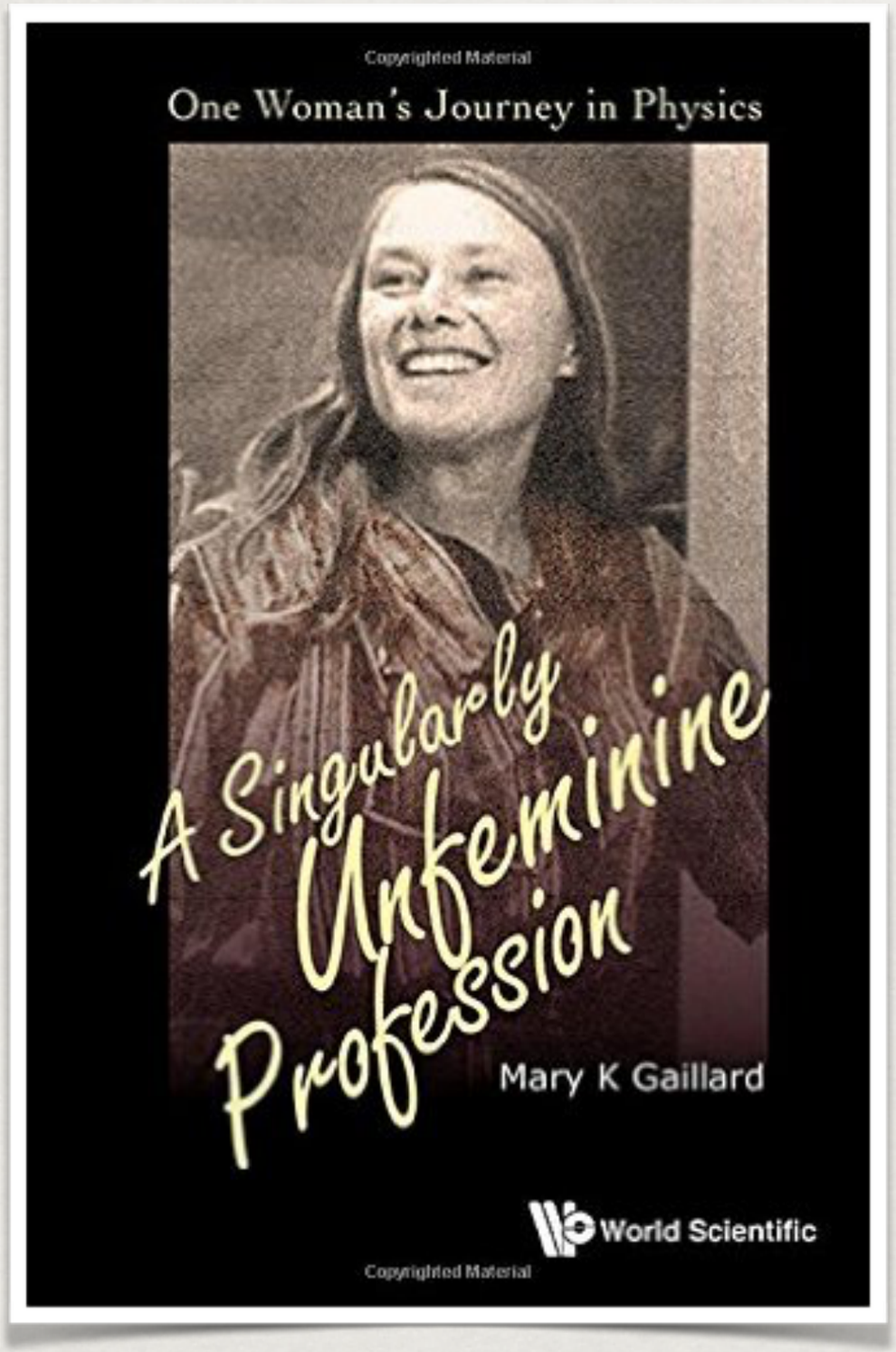
2) The video talk by Marika Taylor at Strings 2017 :
https://www.youtube.com/watch?v=jx-F7BqDB-Q&feature=youtu.be :

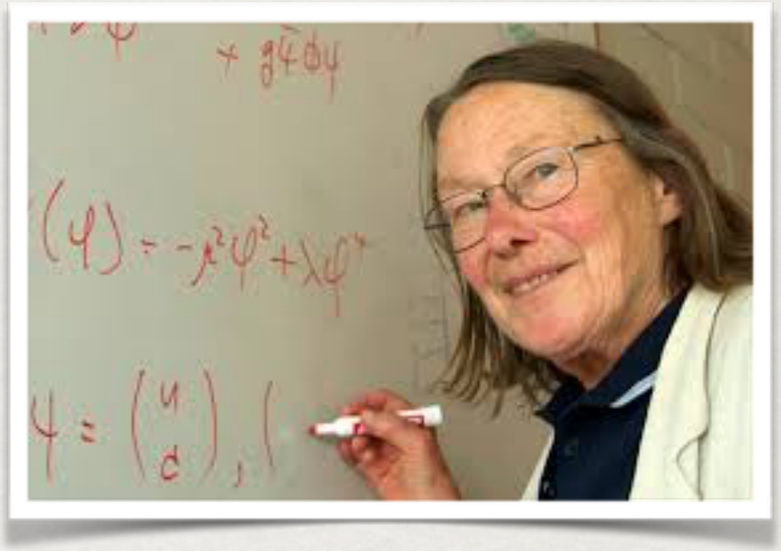
COST String Theory Universe http://www.weizmann.ac.il/stringuniverse/ Please look specifically at the page :http://www.weizmann.ac.il/stringuniverse/group/outreach-wg5 .

3) On unconscious bias the Royal Society movie:
https://royalsociety.org/topics-policy/publications/2015/unconscious-bias/

and some popular ones used in training sessions by McKinsey and Accenture, available on You Tube :
https://www.youtube.com/watch?v=JFW2cfzevio
https://www.youtube.com/watch?v=2g88Ju6nkcg

Role Models: the book by Mary K Gaillard prof at U. C. Berkeley





- Fighting for gender balance is important, but it is one more task for the women...

GENDER BIAS??

Thank you!