

## SYDE 1: Diversity and Equality in Physics

Time: Tuesday 9:30–12:15

Location: PTB HS HvHB

**Invited Talk** SYDE 1.1 Tue 9:30 PTB HS HvHB  
**Workplace cultures in physics as a game changer for equal opportunities** — ●MARTINA ERLEMANN — FU Berlin, FB Physik

In recent decades there has been a growing awareness that a scientist's gender can have an impact on a career in physics, even though it should have no influence. This applies also for ethnicity or national background, social background, and other social characteristics which can have a detrimental impact on a career in science. The talk will present research on gender and diversity in physics, with a particular focus on studies of workplace cultures in physics and their impact on young scientists' sense of belonging to the physics community. It will be argued that improving the workplace cultures can be a game changer in combating discrimination and diversifying the physics community, which would also benefit physics research.

**Invited Talk** SYDE 1.2 Tue 10:00 PTB HS HvHB  
**Science on the Web: How networks bias academic communication online** — ●AGNES HORVAT — Northwestern University, Evanston, USA

Most academics are promoting their work online. At the same time, the public, journalists, and interested governments increasingly turn to the Web for scientific information. It thus becomes ever more critical that we better understand the dynamics of online science dissemination networks. My talk presents our latest results about (1) how scientific publications spread on various types of online platforms, losing essential information; (2) how gender and ethnic inequalities impact the coverage of scholarship; and (3) how subsequently retracted articles receive more attention online. Our findings highlight crucial biases in the online sharing of science. They inform efforts to close gaps in scholars' success and curb the online spread of science-related misinformation.

**Invited Talk** SYDE 1.3 Tue 10:30 PTB HS HvHB  
**Citation inequity and gendered citation practices in contemporary physics** — ●ERIN TEICH<sup>1</sup>, JASON KIM<sup>2</sup>, CHRISTOPHER LYNN<sup>3</sup>, SAMANTHA SIMON<sup>4</sup>, ANDREI KLISHIN<sup>5</sup>, KAROL SZYMULA<sup>6</sup>, PRAGYA SRIVASTAVA<sup>7</sup>, LEE BASSETT<sup>4</sup>, PERRY ZURN<sup>8</sup>, JORDAN DWORKIN<sup>9</sup>, and DANI BASSETT<sup>4</sup> — <sup>1</sup>Wellesley College — <sup>2</sup>Cornell University — <sup>3</sup>Yale University — <sup>4</sup>University of Pennsylvania — <sup>5</sup>University of Washington — <sup>6</sup>University of Rochester — <sup>7</sup>NemaLife — <sup>8</sup>American University — <sup>9</sup>Federation of American Scientists

The under-attribution of women's contributions to scientific scholarship is well-known and well-studied, and its effects are felt today in numerous ways by women scientists, including lower interest in collaboration and lower perception of academic excellence. Yet another crucial metric of under-attribution within scientific scholarship is the under-citation of papers authored by women relative to expected rates, and the corresponding over-citation of papers authored by men. This citation "gap" has been quantified in fields ranging from international relations to astronomy. Here, we quantify the citation gap in contemporary physics by analyzing over one million articles published over the last 25 years in 35 physics journals, and we also find that citation imbalance varies according to who is citing, where they are citing, and what they are citing. Thus, we demonstrate that although citation behavior is a personal action, it adheres to certain trends at the pop-

ulation level, and has wide-ranging and potentially damaging effects. We also discuss possible strategies for the mitigation of these effects.

**15 min. break**

**Invited Talk** SYDE 1.4 Tue 11:15 PTB HS HvHB  
**The Diversity-Innovation Paradox in Science** — ●BAS HOFSTRA — Radboud University, Nijmegen, The Netherlands

Prior work finds a diversity paradox: Diversity breeds innovation, yet underrepresented groups that diversify organizations have less successful careers within them. Does the diversity paradox hold for scientists as well? We study this by utilizing a near-complete population of \*1.2 million US doctoral recipients from 1977 to 2015 and following their careers into publishing and faculty positions. We use text analysis and machine learning to answer a series of questions: How do we detect scientific innovations? Are underrepresented groups more likely to generate scientific innovations? And are the innovations of underrepresented groups adopted and rewarded? Our analyses show that underrepresented groups produce higher rates of scientific novelty. However, their novel contributions are devalued and discounted: For example, novel contributions by gender and racial minorities are taken up by other scholars at lower rates than novel contributions by gender and racial majorities, and equally impactful contributions of gender and racial minorities are less likely to result in successful scientific careers than for majority groups. These results suggest there may be unwarranted reproduction of stratification in academic careers that discounts diversity's role in innovation and partly explains the underrepresentation of some groups in academia.

**Invited Talk** SYDE 1.5 Tue 11:45 PTB HS HvHB  
**Gender and retention patterns among U.S. faculty** — ●AARON CLAUSET — University of Colorado Boulder, USA

Women remain underrepresented among faculty in nearly all academic fields in the U.S. Despite broad interest in measuring, explaining, and mitigating gendered attrition in faculty careers, the scale and heterogeneity of American higher education has impeded a full understanding of its magnitude and variation, and whether men and women leave academia for similar or different reasons.

Using a census of 245,270 tenure-track and tenured professors at U.S.-based PhD-granting departments, including all PhD-granting Physics departments, we show that women leave academia overall at higher rates than men at every career age, largely because of strongly gendered attrition at lower-prestige institutions, in non-STEM fields, and among tenured faculty. These results contrast with the historical focus of studies on high-prestige institutions, on STEM fields, and on pre-tenure faculty. A large-scale survey of the same faculty indicates the reasons faculty leave are gendered, even for institutions, fields, and career ages in which retention rates are not. Specifically, women are more likely to feel pushed from their jobs and less likely to feel pulled towards better opportunities, and women leave or consider leaving due to workplace climate issues more often than work-life balance issues, which is the most popular explanation of gendered faculty attrition. These results highlight the importance of understanding the gendered reasons for attrition rather than focusing on rates alone.