Demographic studies of major conferences in heavy ion physics

Christine Nattrass for the RHIC/AGS UEC+others

4 March 2022

Carlota Andres, Ron Belmont, Jennifer Blue, Geraldine L. Cochran, Megan Connors, Justin Frantz, Debora Mroczek, Christine Nattrass, Jacquelyn Noronha-Hostler, Stacyann Nelson, Christina Markert, Rosi Reed, Sevil Salur, Patrick Steffanic, Deepa Thomas, Zhenyu Ye

Paper in preparation

I take full responsibility for any mistakes or provocative statements

Why do we need statistics?

- We can see things happen but need data to back it up to lead to change
- Theorists do not have speaker bureaus, have no oversight to see that talks are fairly distributed by groups, seniority, nationality, gender etc
- A healthy, growing field allows for a diversity of ideas and influx of new members
- We do not know what our field looks like. How many theorists? Where are we? Who are we? What do we work on?

We see a problem but we don't have data

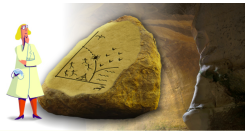
The 2nd International Conference on the
Initial Stages in High-Energy Nuclear Collisions

Initial Stages 2014

December 3rd - 7th
Napa, CA
Embassy Suites Napa Valley

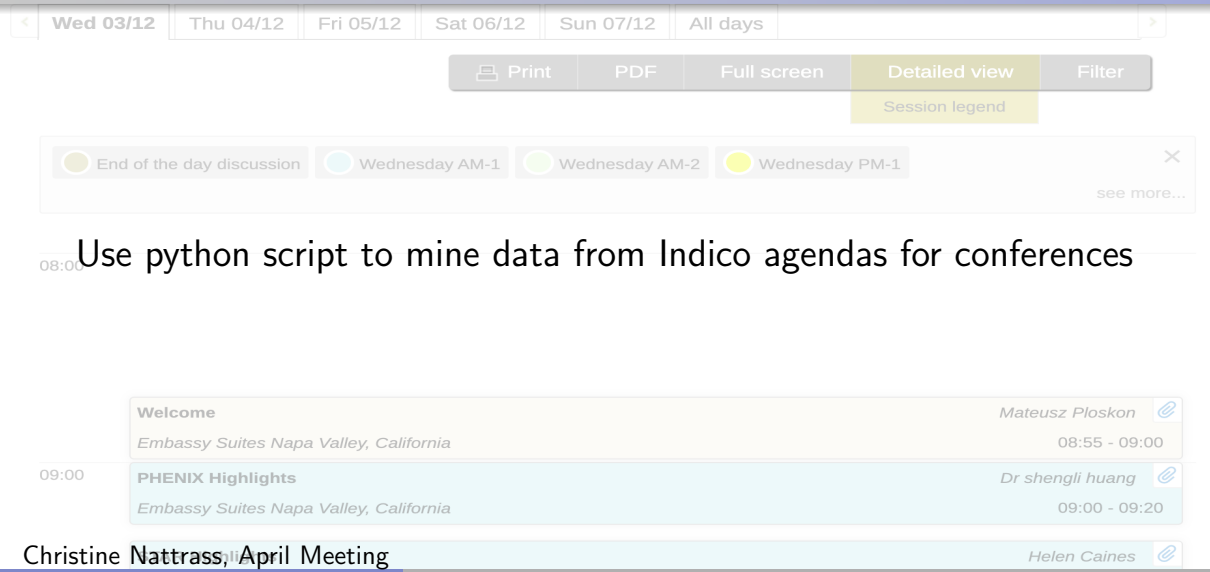
Zero female plenary theory speakers

IS2021
The VIth International Conference on the
INITIAL STAGES
OF HIGH-ENERGY NUCLEAR
COLLISIONS



Zero female plenary experimental speakers

Conference statistics



Use python script to mine data from Indico agendas for conferences

Procedure

- Data from Python code uploaded to database
- Chairs, student lectures, flash talks deleted
- Posters separated out, moved to separate list (when available)
- All approximately 2500 names are added a central database where gender and theory vs. experimentalist is identified. Crowd source to assist with identification. (*Thanks to everyone who helped!*)
- For an individual we can track plenaries, parallels, (some posters) by conference series and year
- Unidentified speakers $\rightarrow$ assume all male, all female $\rightarrow$ uncertainty

Theory vs experiment

Theory

- Single PI/small collaborations
- Smaller % of the field
- More senior speakers

Experiment

- Large collaborations
- Speaker boards
- Abstracts clearly marked
- Students/postdocs get more talks

Gender identity

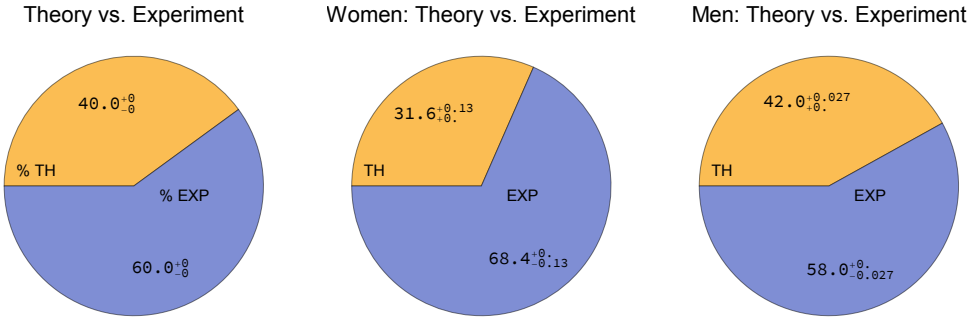
- Our field is small enough that we know the majority of our speakers and their gender identity. Crowd source identification.
- We always categorize speakers by their preferred gender identity.
- We don't have enough non-binary speakers (that we're aware of) to be able to separate out these speakers into their own category
- Physics Education Researchers: Geraldine Cochran (Rutgers and from APS) and Jennifer Blue (Miami University) provide knowledge on gender identity

Conferences studied

Year	Conferences
2011	QM
2012	QM
2013	SQM, IS
2014	QM, IS
2015	QM
2016	HP, SQM, IS
2017	QM, SQM, IS
2018	QM, HP
2019	QM, SQM, IS
2020	HP
2021	SQM, IS
2022	QM

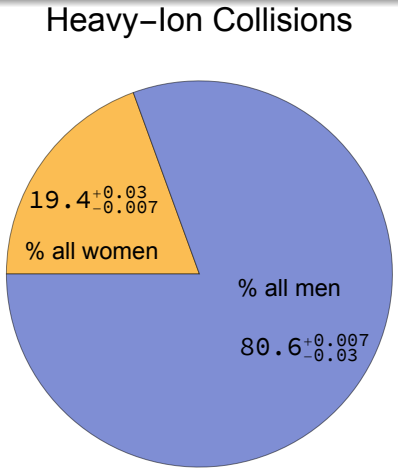
- Ongoing conference series
- At least 100 participants
- Large enough to separate into parallel, plenary, and posters
- Information about posters only available for some conferences
- Some data from smaller conferences and workshops (CPOD, JetTools, RHIC/AGS Annual Users' Meeting, JETSCAPE school) for reference

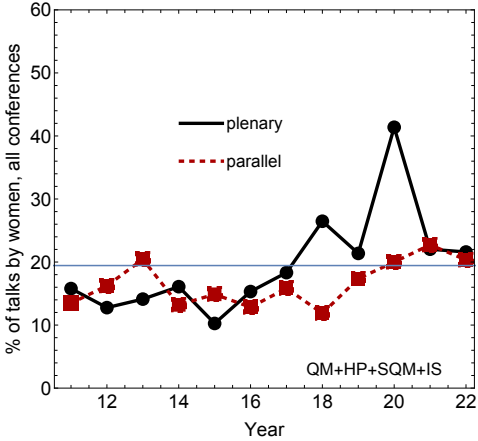
What does our field look like?



Summary of our estimation of the theorist vs experimentalists in the field for those people who have attended at least once of the conferences since 2011 to present for the entire field (left), women (middle), and men (right).

How many women are in the field?





- Our data indicate that the number of women has increased during this time period.

Experimentalists

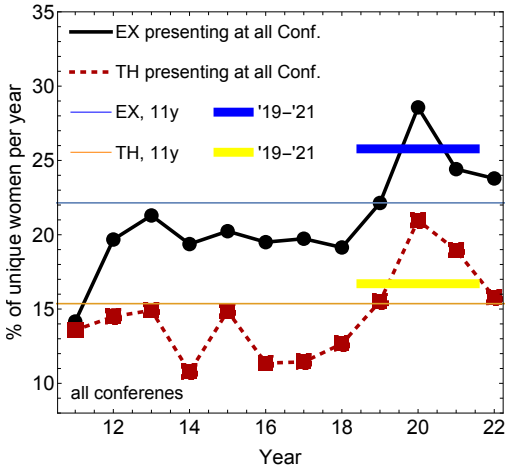
	Collaborators	% women
ALICE	1005	23%
ATLAS	~ 50	$\sim 30\%$
PHENIX	104	21%
STAR	370	15% (7% undeclared)

ALICE	
Category	% women
PhD Student	31.3%
Post doc	23.2%
Physicist	17.9%
Senior Engineer	12.7%

Theorists

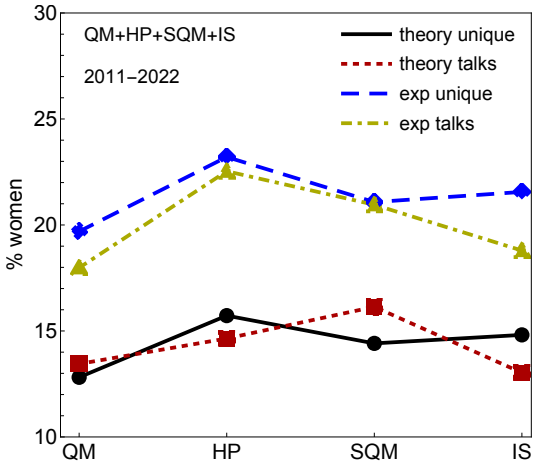
- Harder to quantify
- 2020 JETSCAPE School: 20%
- Hot Quarks speakers: 14–18% female (higher recently)
  - Skews young, towards US & Europe
- Sample used in this analysis: 15%
  - Overall average apt to underestimate current fraction of women

Theorists vs experimentalists



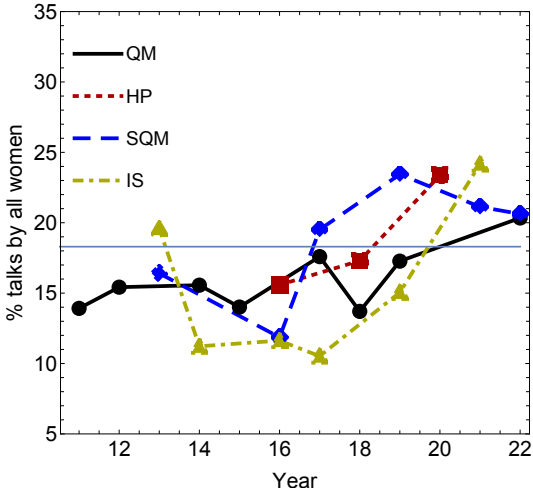
- Theory has largest increase
- Need to account for increase in % of women
- Fixed Quotas over time, will hurt women

Unique speakers vs Talks given



- Unique female speakers: $\frac{N_w}{N_w+N_m}$
- Talks given by women: $\frac{\sum_{i=0}^{N_w} t_i}{\sum_{i=0}^{N_w} t_i+\sum_{i=0}^{N_m} t_i}$
- t_i: Number of talks for an individual speaker
- Error bars: unidentified speakers are classified either as all men or all women
- If unique speakers $>$ talks, conference has a deeper pool of potential speakers to draw from

Conference series over time

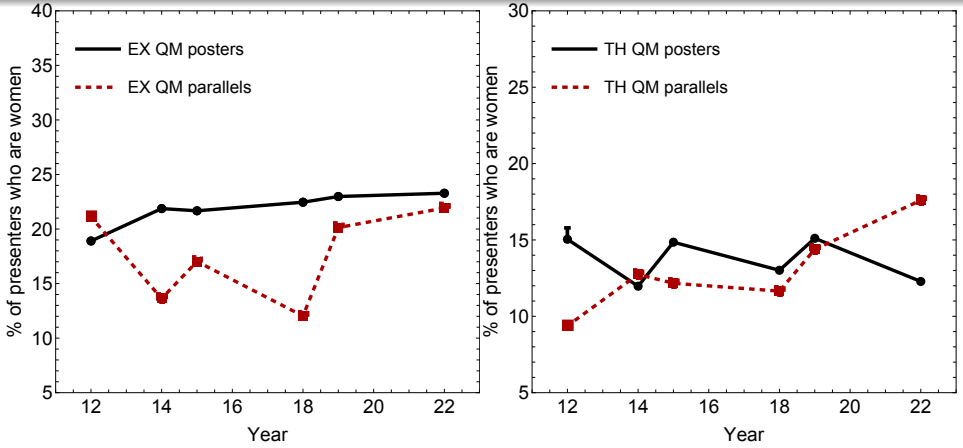


- Some conference series have improved over time
- But most conferences should be at about 23% by now!

Posters: Possible biases

- Rejected abstracts receive posters
- We don't necessarily have all the poster data
  - Some conference editions didn't have posters
  - Some poster data is incomplete
  - Some people don't attend if they receive a poster
  - Poster speakers are harder to identify
- Still have large enough statistics to investigate

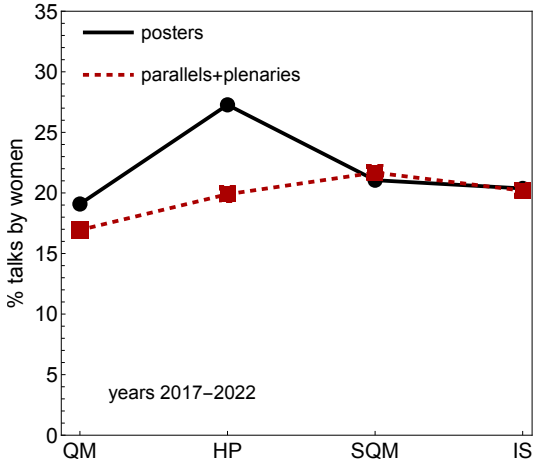
Poster vs parallel presentations



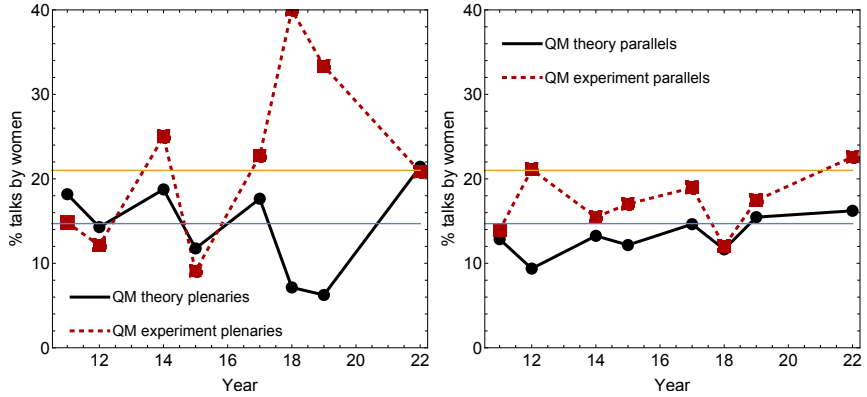
Data from Quark Matter only.

Women are **much more** likely to be rejected for a parallel talk, given a poster.

All posters


posters
parallels+plenaries
% talks by women
years 2017–2022
QM
HP
SQM
IS
0
5
10
15
20
25
30
35

Quark Matter: Plenaries vs Parallels



- Female theorists underrepresented among plenary speakers
- Female experimentalists underrepresented among parallel speakers

Issues for theorists

- Senior/repeat speakers take up a lot of space
- Women much more likely to receive posters than parallels
- % of female theorists increasing over time, but not always reflected in parallels/plenaries

Issues for experimentalists

- Speaker boards consistently lead to underrepresentation of women for parallel talks.
  - This may be a reflection of nominations from the collaboration.
- Vision talks (i.e. plenaries on a topic X, not collaboration plenaries) given to fewer women
- Do conferences need to reject poorly represented speaker slates?

Repeat speakers

- Difficult to find a constructive way to demonstrate this...
- Small fraction of speakers are significantly over-represented.

has **never** been given by a women.

Seriously, we checked back to the 1990's...

has **never** been given by a women.

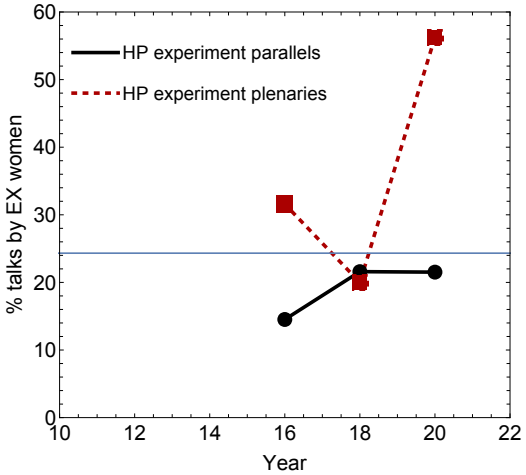
But it will be given by a woman at Quark Matter 2023!!

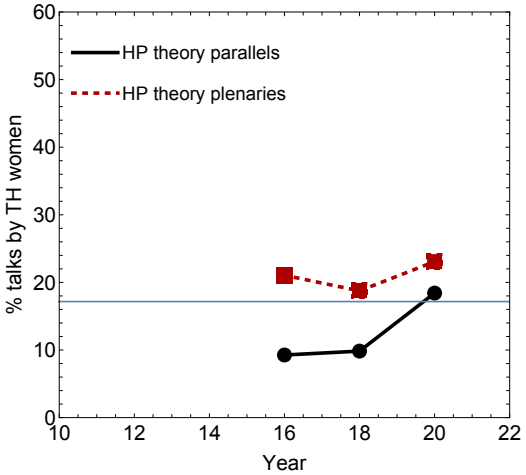
Ideas for what to do

- Use a data base of speakers (Add features to Inspire!)
- Double blind review for first round
- Increase the number of talks & posters
- Use a multi-stage process for review of abstract review, candidate speakers for major conferences
- Open call for (anonymous) speaker nominations
- Institute a standing body to provide some continuity for major conferences
- Require conference hosts to address procedure for allocating talks in host proposal
- Explicit rules for how frequently someone can give a plenary talk
- Collaboration could have more info on possible speakers (career status, analysis topics, other talks given) - or use Inspire

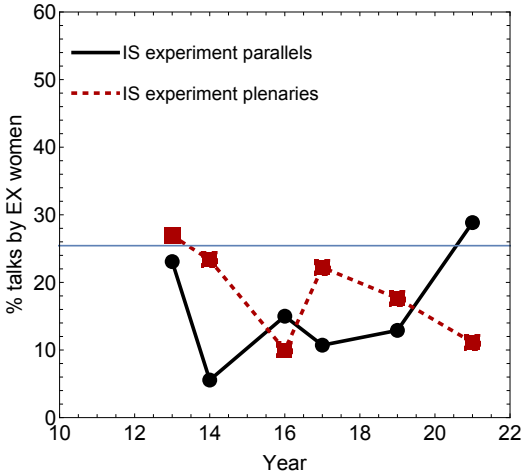
Still finalizing recommendations - this is my opinion alone!

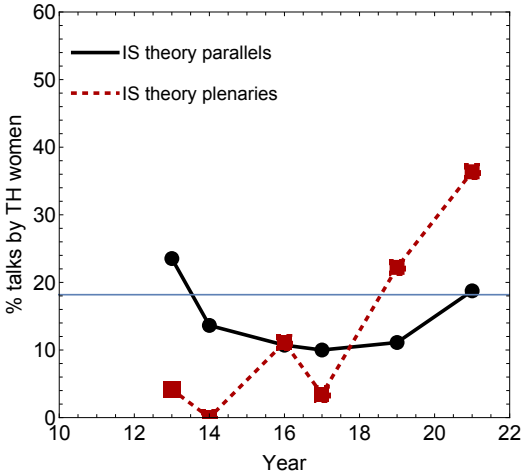
Hard Probes

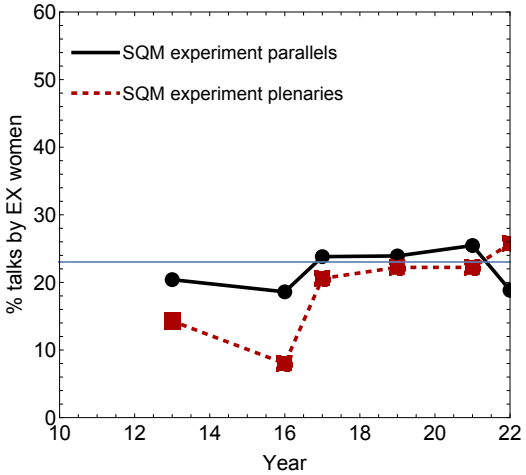

HP experiment parallels
HP experiment plenaries
% talks by EX women
Year
0
10
20
30
40
50
60
10
12
14
16
18
20
22

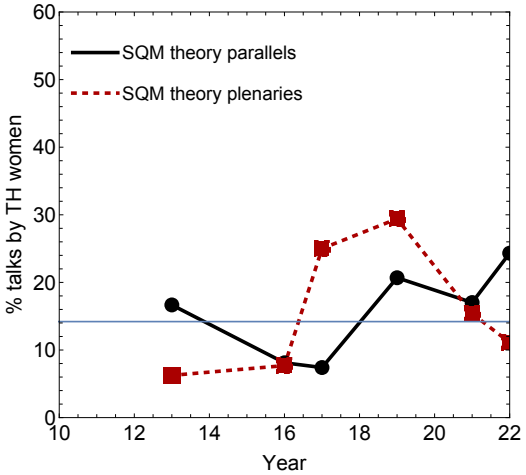

HP theory parallels
HP theory plenaries
% talks by TH women
Year
0
10
20
30
40
50
60
10
12
14
16
18
20
22

Initial Stages






SQM experiment parallels
SQM experiment plenaries
% talks by EX women
Year
0
10
20
30
40
50
60
10
12
14
16
18
20
22


SQM theory parallels
SQM theory plenaries
% talks by TH women
Year
0
10
20
30
40
50
60
10
12
14
16
18
20
22