

ECR Input on Training in Instrumentation

Sarah Williams (University of Cambridge)

On behalf of the ECFA ECR Panel

Thanks to the ECFA ECR Detector R+D working group for their input and hard work gathering input for this discussion: Jan-Hendrik Arling (DESY), Liron Barak (Tel Aviv University), Katie Dunne (Stockholm University), Armin Fehr (University of Bern), Adrián Irlés (IFIC CSIC/UV), Magdalena Kuich (University of Warsaw), Predrag Milenovic (University of Belgrade), Steven Schramm (University of Geneva), Mariana Shopova (Plovdiv University/Bulgarian Academy of Sciences), Sarah Williams (University of Cambridge)

Introduction

- The term “Early Career Researcher” (ECR) now encompasses a broad range of experiences within HEP from students up to non-tenured academics, and we should also be aware of diverse backgrounds (engineering/physics) and increasing interdisciplinarity within our field.
- This talk will include input from multiple areas:
 - The [ECFA ECR Panel](#) (formed in 2020) and its working group on detector R+D (formed to provide input to this process).
 - An open “[Townhall meeting](#)” that took place on Wednesday 7th April.
 - A survey compiled and circulated after this meeting, filled out by 473 ECRs, including those not involved in instrumentation work (many thanks to those who took the time to fill this out) to understand their experiences/ views with training.

The 2020 European Strategy Update

7. Environmental and societal impact

B. Particle physics, with its fundamental questions and technological innovations, attracts bright young minds. Their education and training are crucial for the needs of the field and of society at large. ***For early-career researchers to thrive, the particle physics community should place strong emphasis on their supervision and training. Additional measures should be taken in large collaborations to increase the recognition of individuals developing and maintaining experiments, computing and software. The particle physics community commits to placing the principles of equality, diversity and inclusion at the heart of all its activities.***

=> Very relevant to this symposium !

Key Points for discussion

There is a lot of interest and enthusiasm for instrumentation work within the ECR community

BUT

- There are concerns about support (financial, but also logistical/ practical and/or lack of encouragement)
- ECRs would benefit from more networking opportunities for those involved in instrumentation work.
- Recognition is a concern: some feel instrumentation work will not help them secure a future career in particle physics:
 - Irrespective of whether this is true- how instrumentation work is recognised should be revisited.
 - This should be done in parallel to developing additional training opportunities.

Summary of Townhall meeting

<https://indico.cern.ch/event/1021159/>

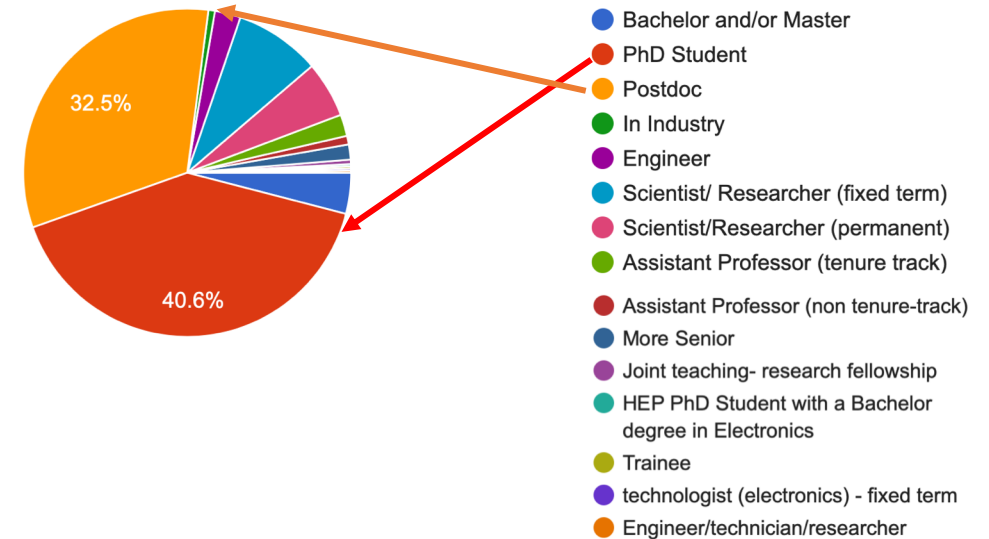
- Several guided discussions on:
 - Education
 - Career pipelines and diversity
 - Experience in different research environments
 - Questions provided by the roadmap conveners (details [here](#)).
- Polling questions to understand views/ backgrounds of participants.
- Key points from discussions included:
 - (Different) Experiences of support for instrumentation training.
 - How to break down institutional barriers?
 - (Gender) diversity in instrumentation groups - do the working patterns impact involvement from minority groups?

Survey results

- The survey was widely distributed around ECR networks within experimental collaborations and national/international mailing lists
- We apologise to anyone missed (let us know so we can expand our network of contacts) and hope that today's discussion will allow us (all) to gather (more) information.

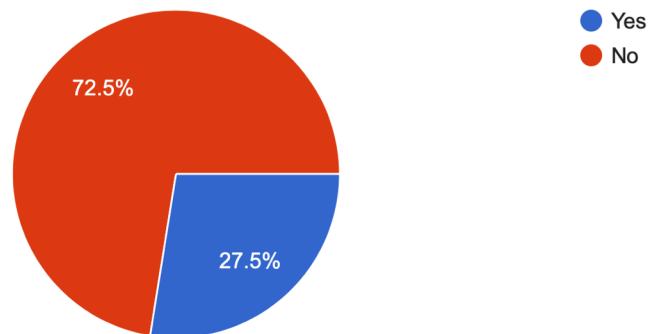
What is your current position?

471 responses



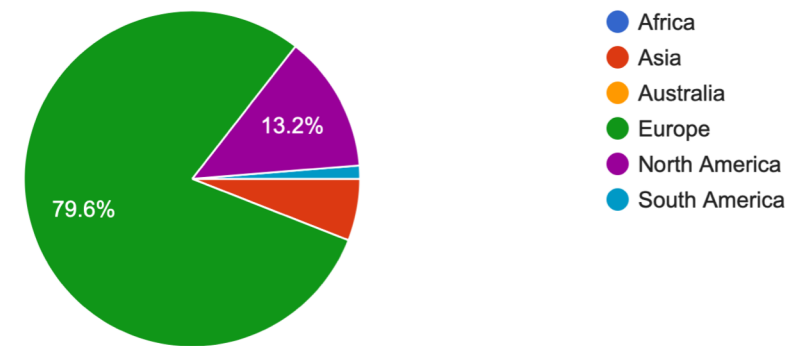
I identify as an underrepresented minority in my field

465 responses



Region of Employment/Current Education

471 responses



ECR involvement in instrumentation

- Of the 473 that filled the survey:
 - ~30% currently spend 0% of their time on instrumentation, whilst ~20% spend >80% of their time.
 - 68% are employed by a university, and 23% by a laboratory.
- 44 respondents filled out the section relevant for engineers.
- 49% cited that training in instrumentation had been available at bachelor level, whilst 68% said it was available in their masters/PhD institution.

Support for instrumentation training

Out of 453 respondents, 32% said they had not expressed an interest in training, whilst 38% had been able to access it -> 30% had expressed an interest in instrumentation training but had not been able to access it...

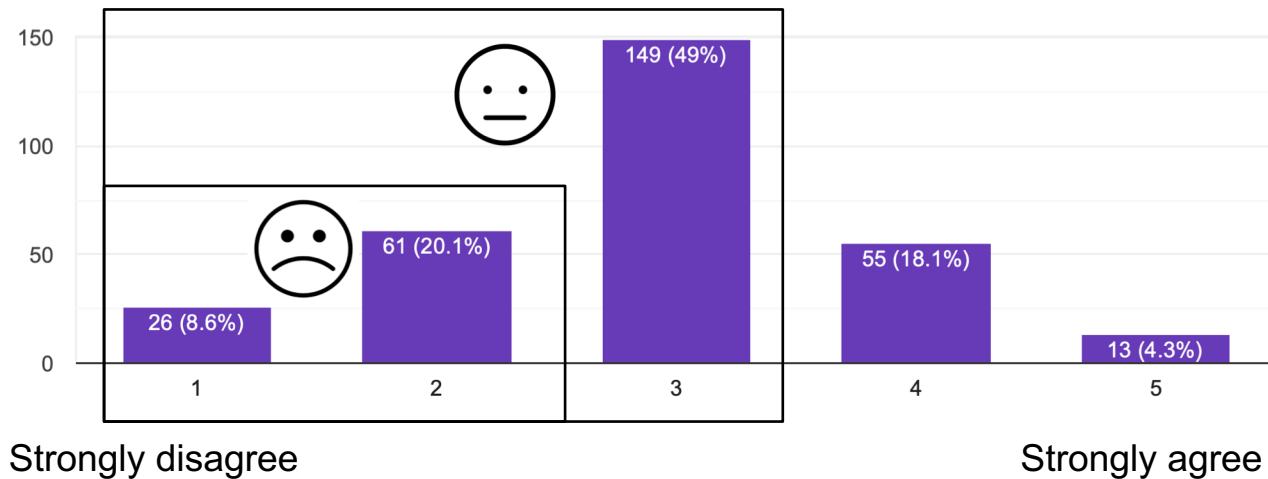
Need to ensure that instrumentation training is supported:

- By supervisors/ group leaders- by **encouraging** ECRs to follow training relevant to their current work and in new areas.
- Financially- by providing **funding** to support ECR participation in summer schools/ training events.
- Institutionally- **providing** and **participating** in instrumentation training should be **recognised** when considering career progression/ hiring.

Networks for ECRs in instrumentation

I am satisfied with networking opportunities for early career researchers in instrumentation that are available to me

304 responses



~ 80% not positive about their networking opportunities

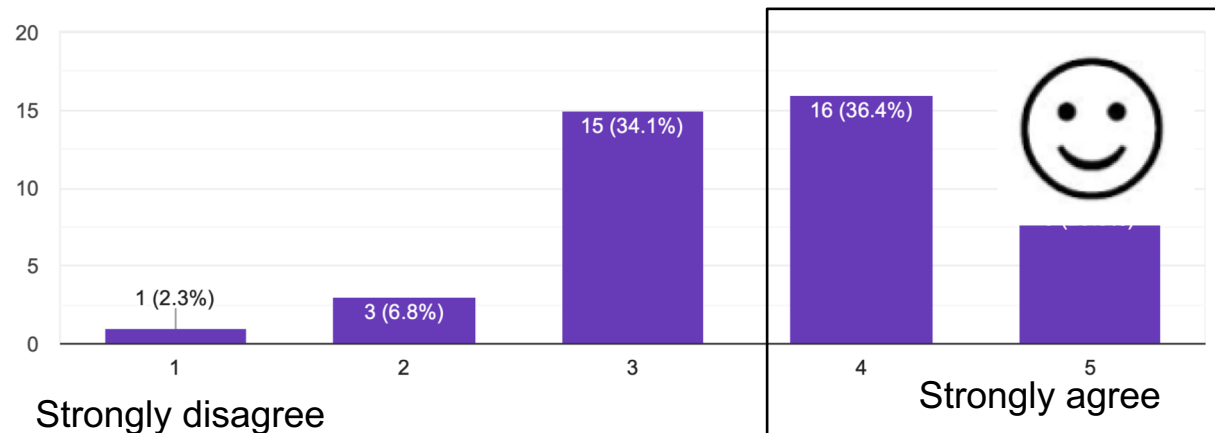
- As well as the need to establish networks for those in instrumentation, the importance of providing guidance/training on **'how to network'** to PhD students was highlighted.
- Improve links with industry (124/325 respondents to one section cited the need to strengthen opportunities for industry internships)
- Possibility for cross-experiment networks in instrumentation?
- How to support the increasing interdisciplinarity? (i.e. quantum sensors)

Recognition for instrumentation work

-> **Need to account for the variety of individuals involved in instrumentation work and ensure that it contributes positively to their career progression!**

For engineers: As an engineer, I feel my work with non-engineers is collaborative

44 responses

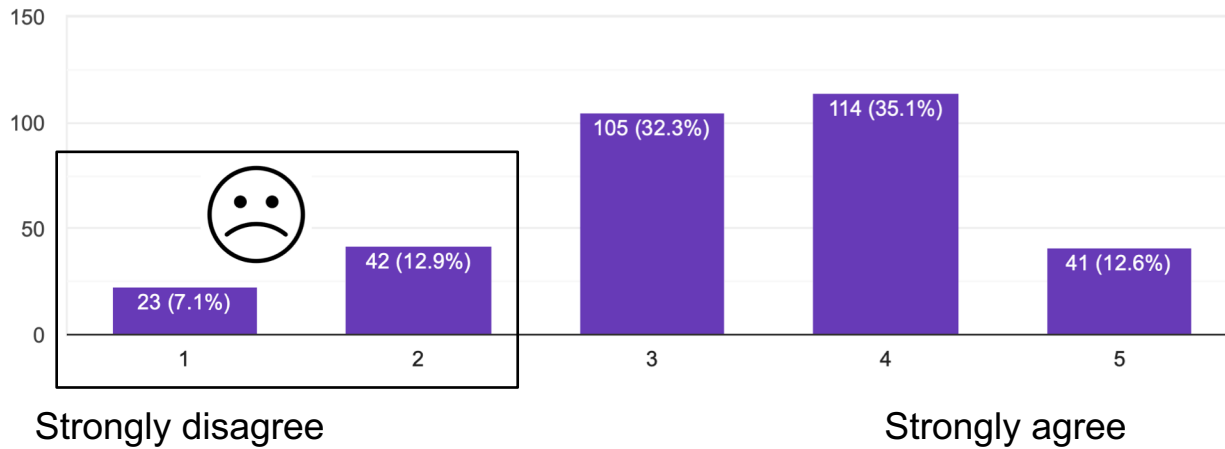


Should establish clear career paths for engineers as well as for physicists specialising in instrumentation

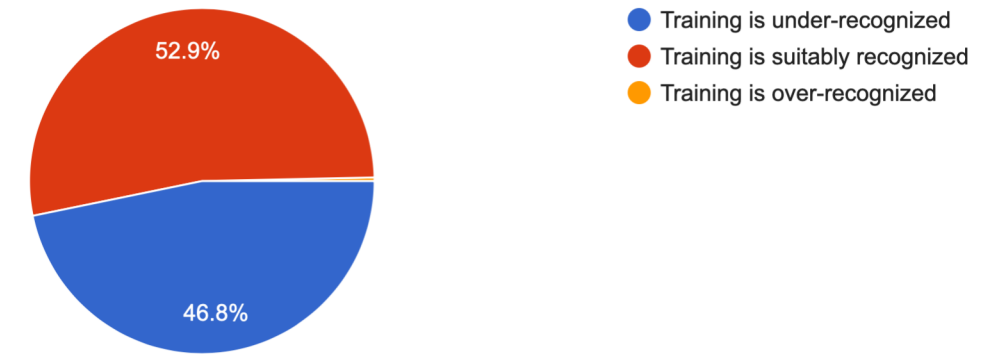
- ~14% of survey respondents reported feeling that they "view instrumentation work as a liability to their career"
 - Of those who see it as a liability, most of them spend >80% of their time on instrumentation
- Need to find ways for the younger researchers to become leaders in their fields

Recognition for instrumentation work/training

I feel the work I do/did in instrumentation is acknowledged in my collaboration/experiment/broader working group
325 responses



Do you feel that work relating to training is properly recognized and rewarded in your instrumentation group?
295 responses

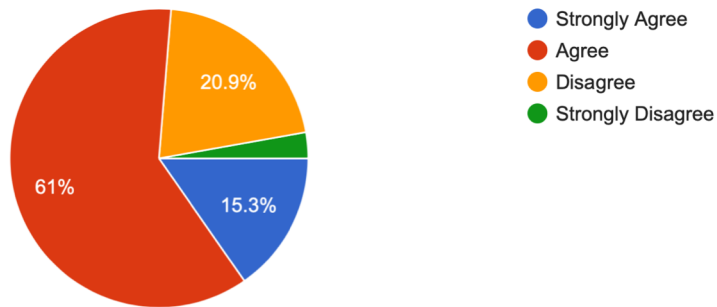


Need to improve recognition/visibility for those involved in instrumentation and those **participating** in, and especially **providing** training!

Diversity in instrumentation

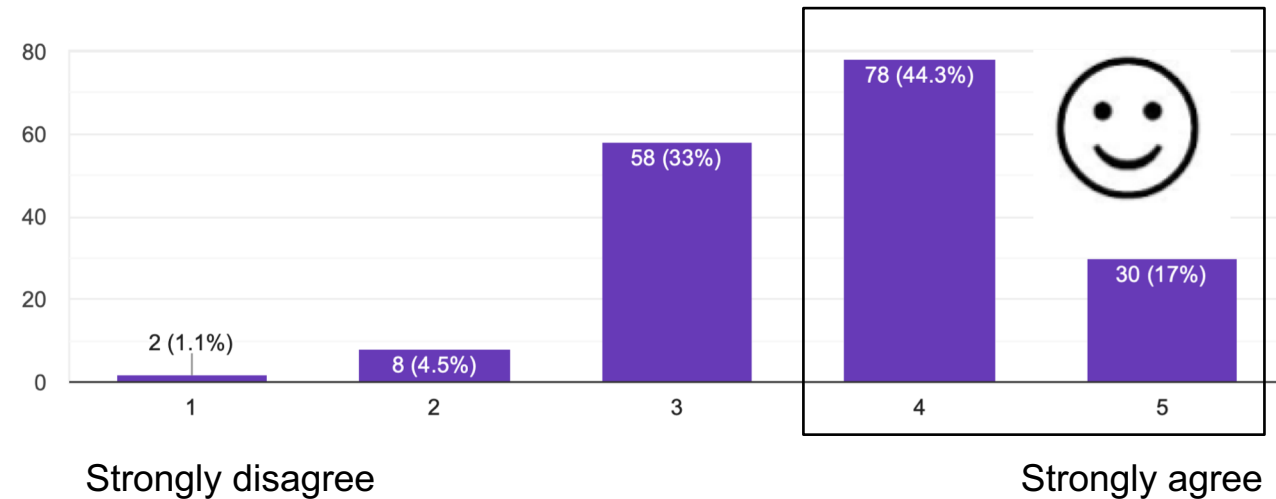
Reminder =>25% of respondents identify as underrepresented minority in the field...

I see my immediate working group as diverse
464 responses

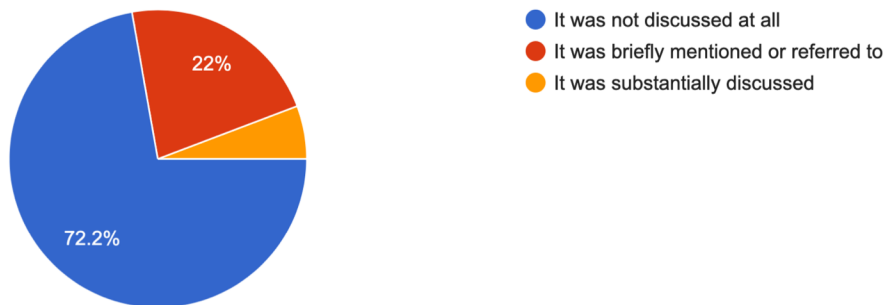


- Issues that impact diversity/inclusion should be considered when planning training programmes
 - More opportunities for remote training (removes access barriers due to travel/financial/care-related/other constraints?)

My experience with remote training/work in instrumentation outside of my own institution was positive
176 responses



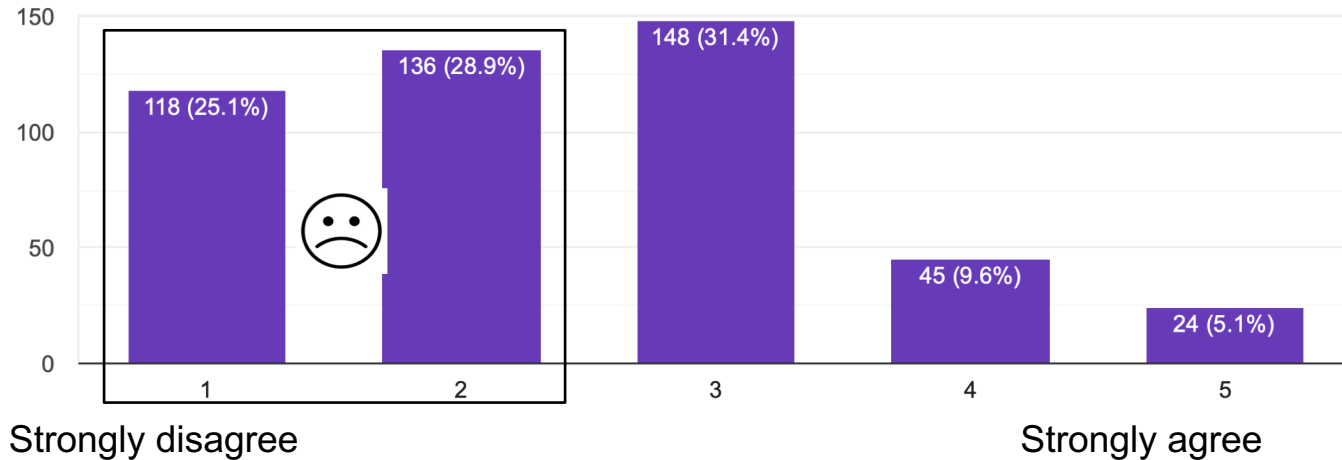
Did your training discuss or otherwise account for diversity?
295 responses



Communicating opportunities

How informed do you feel about opportunities in instrumentation training?

471 responses

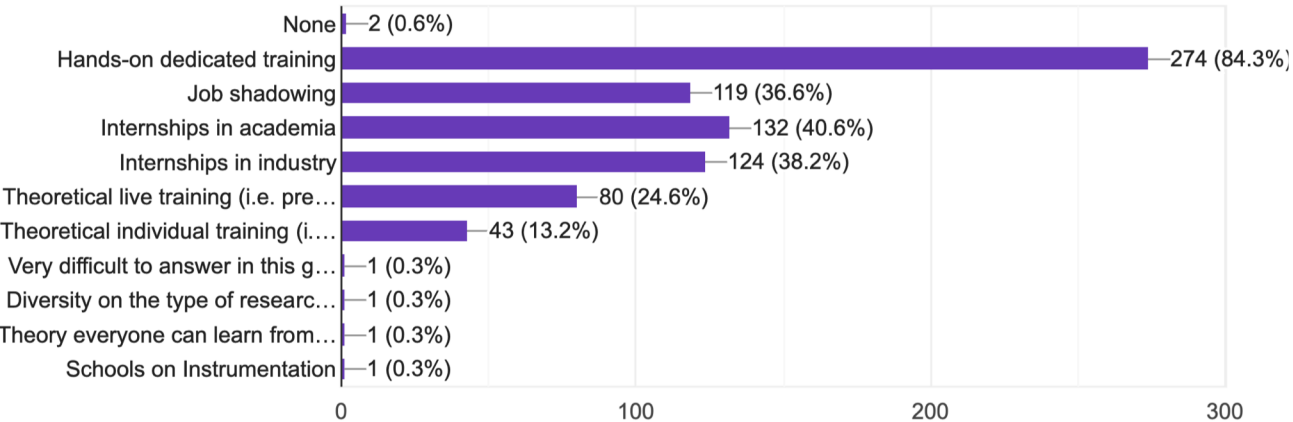


- ~50% do not feel well informed about opportunities for training in instrumentation.
- Perhaps this would benefit from establishing/strengthening networks for those interested in instrumentation.

Different types of instrumentation training

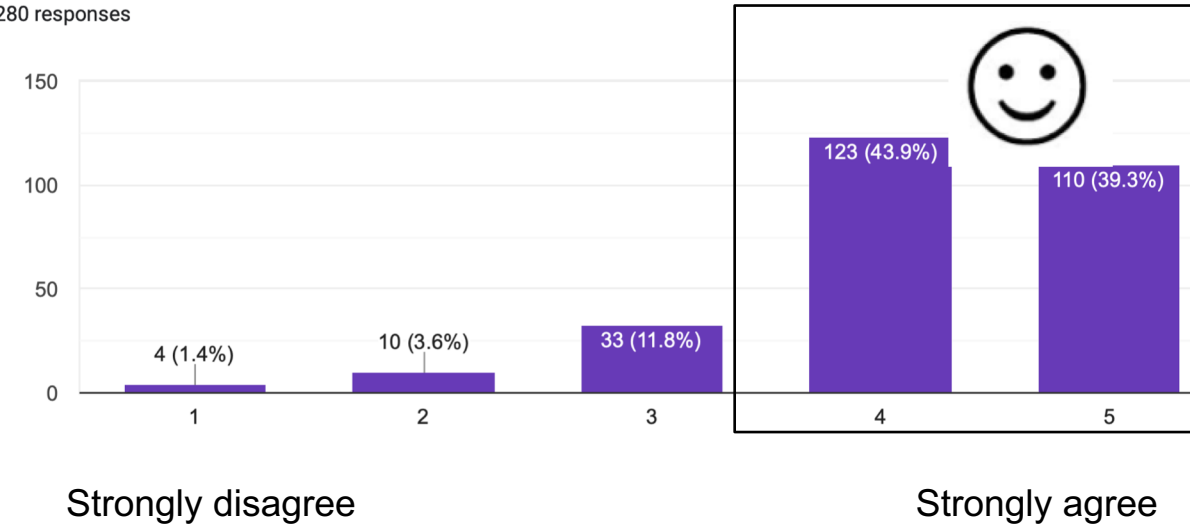
Which form(s) of training should be emphasised more/should be strengthened?

325 responses



If peer-to-peer training were available I would participate

280 responses

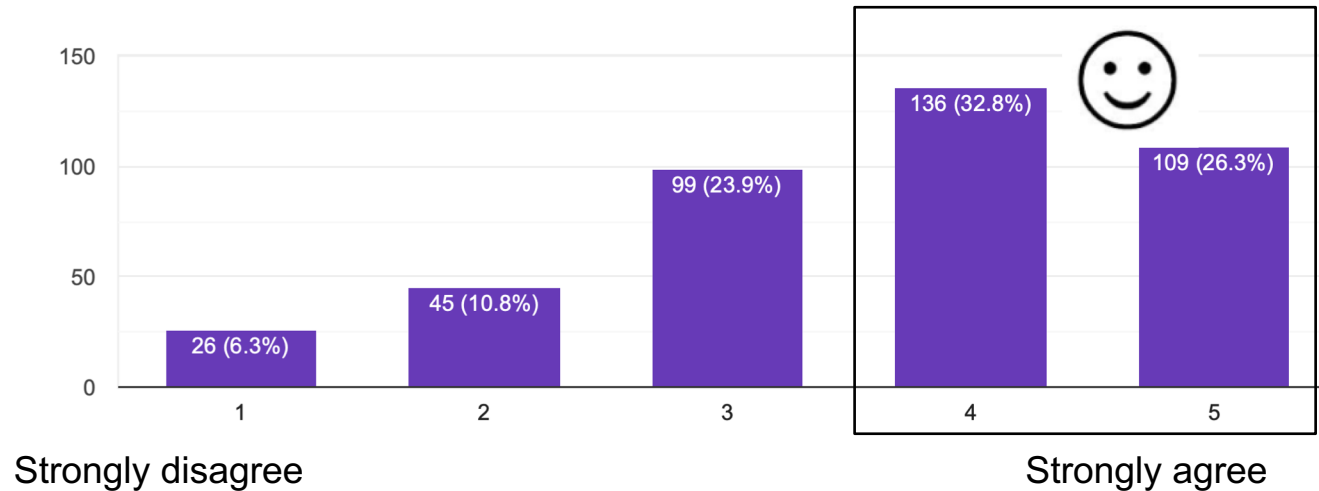


- Lots of support for more/ improved hands on training.
- As in other areas (software), strengthen peer-to-peer training opportunities?

Closing message

I would be more willing/eager to take on instrumentation work if more training were available

415 responses



- **>50% either strongly agreed or agreed with the statement that they would be more willing/eager to take on instrumentation work if more training were available.**

There's a lot of **interest** and **enthusiasm** in the ECR community for instrumentation work, however there are also **barriers**. We are eager to work within the field to improve accessibility to training and networks, and recognition for those involved in designing, delivering and participating in training programs, thus making instrumentation more accessible to and rewarding for the ECR community!

A slide of thank-yous....

- Firstly, thanks to the 473 participants that took time to fill our survey.
- Thanks to the members of the ECR detector R+D for their hard work in the run-up to this meeting.
- Thank you to the roadmap organisers for our invitation to participate in this symposium.

ECFA-ECR Detector R+D working group:

Jan-Hendrik Arling, DESY

Liron Barak, Tel Aviv University

Katie Dunne, Stockholm University

Armin Fehr, University of Bern

Adrián Irlés, IFIC CSIC/UV

Magdalena Kuich, University of Warsaw

Predrag Milenovic, University of Belgrade

Steven Schramm, University of Geneva

Mariana Shopova, Plovdiv University

/Bulgarian Academy of Sciences

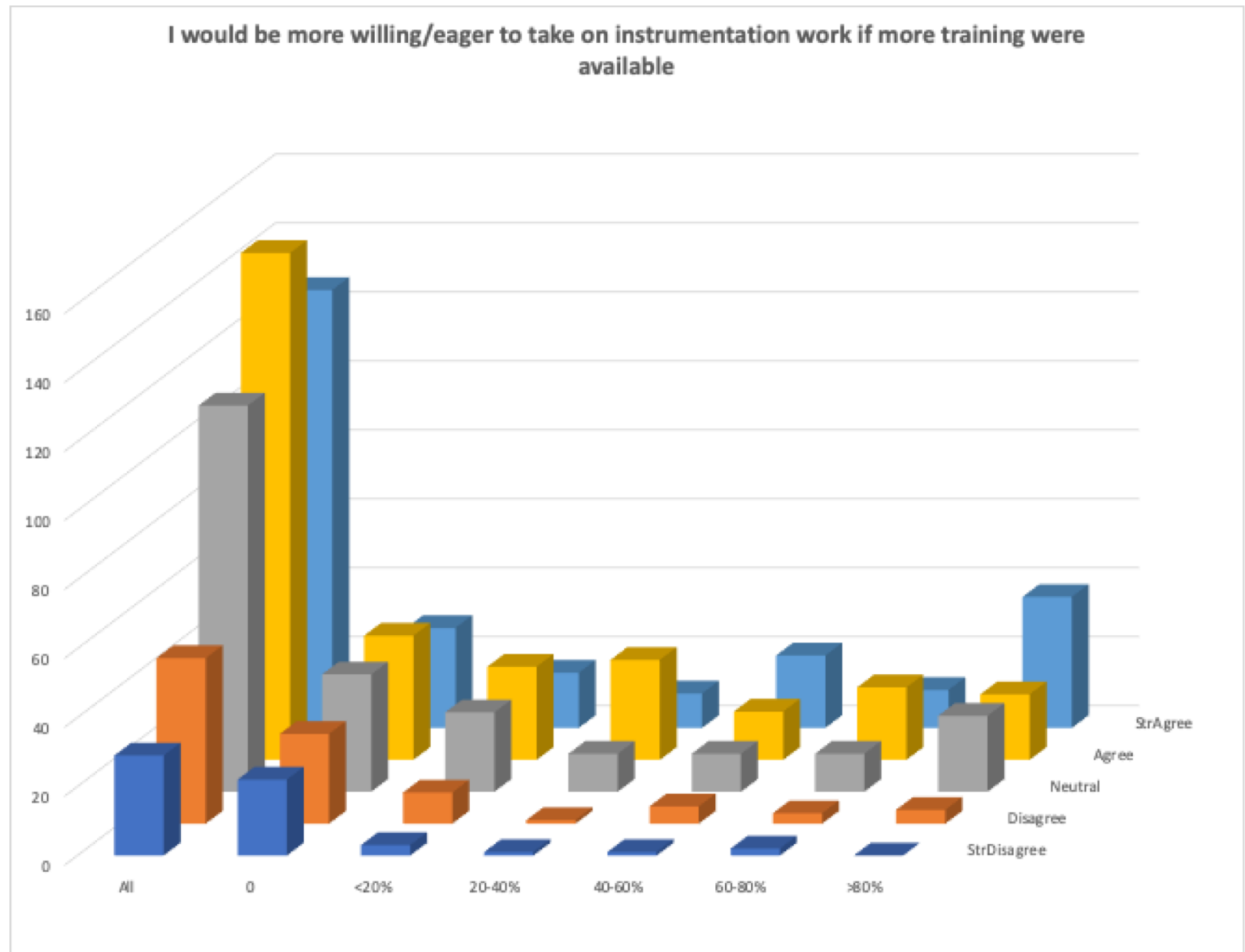
Sarah Williams, University of Cambridge

ecfa-ecr-detector@cern.ch

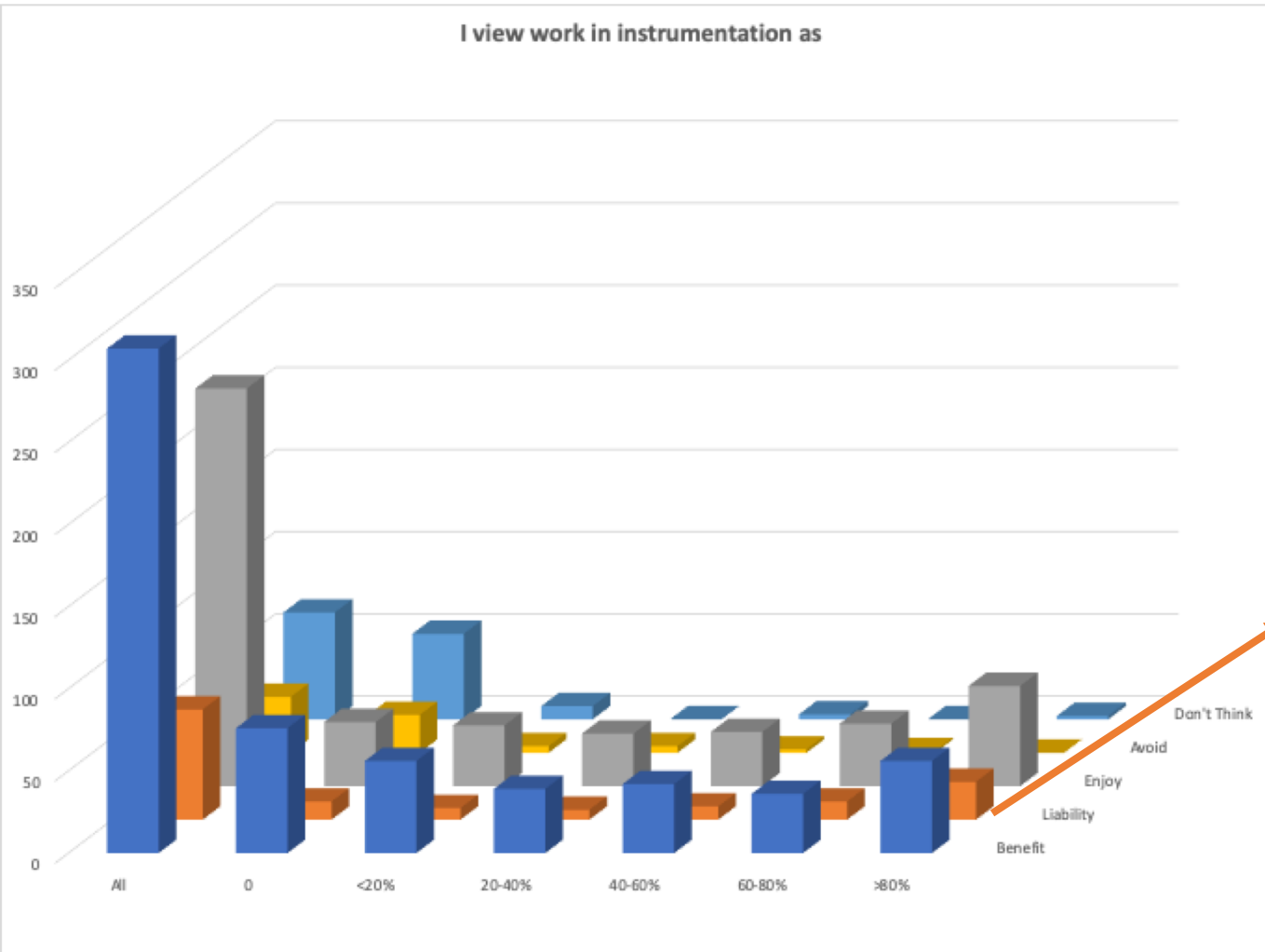
...and now onto the discussion...

Backup-stratified results

- Willingness to undertake (more) instrumentation work if more training were available is fairly consistent across all categories (from those not doing instrumentation to those doing a lot).
- Most of those (strongly) disagreed are those not doing instrumentation-need to address other barriers?



Backup- Views on instrumentation work



Participants were asked to indicate which (non-exclusive) statements apply to how they view instrumentation training including

- “A liability to my career”
- “A benefit to my career”
- “Something I enjoy”
- “Something I would rather avoid”
- “Something I don’t think about”

Of those who view detector work as a liability, the dominant category is those who spend >80% doing instrumentation work. Maybe we need more positions that combine instrumentation and physics analysis?

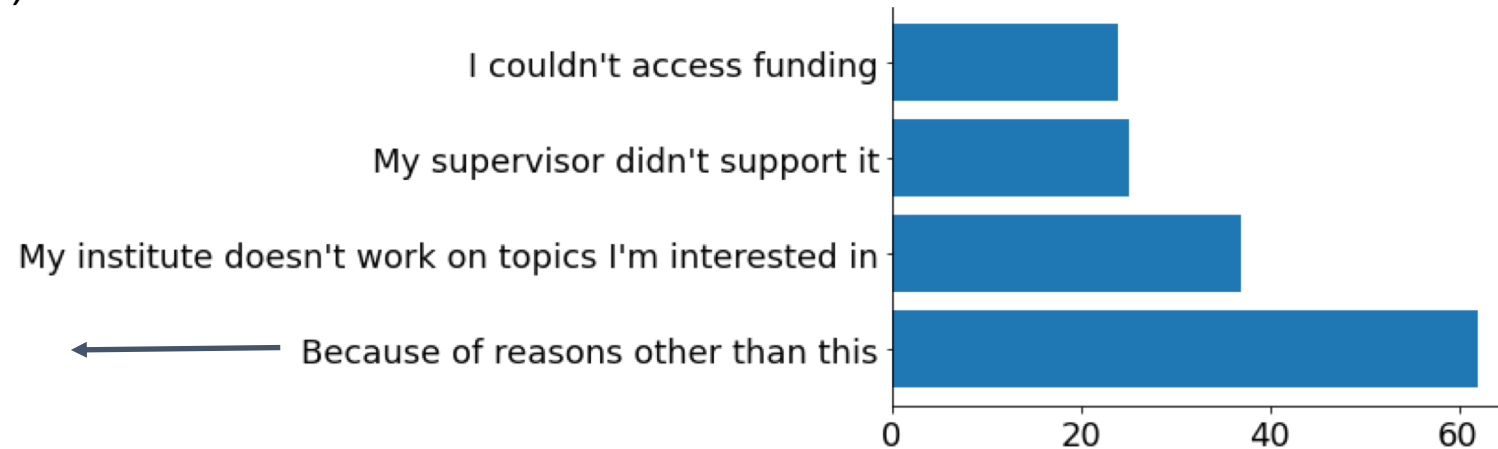
Backup- support for instrumentation training

I have expressed interest in training in instrumentation but was unable to pursue it.... (453 responses)

“I was able to pursue it”- 184 (40.6%)

“I have not expressed an interest” - 154 (34%)

“Yes, because....”



Repeated answers for ‘other’ reasons included:

- COVID-19
- Limited time

(Bars show the number of responses in each category, with the ‘other’ categories merged)