Early-Career Researchers' Panel

114th Plenary ECFA Meeting – Frascati
4th July 2024

Andrea García Alonso & Patrick Dougan

On behalf of the
ECFA Early-Career Researchers Panel

ECFA ECR Panel composition and activities

Members are, in general, PhDs and Postdocs, either with a non-permanent contract or with up to 8 years after obtaining the PhD. Up to 3 members (+1 for countries with LDG lab), among them at least 1 PhD student and 1 postdoc, can be nominated by each ECFA country represented in ECFA for a mandate of 2 years, extendable for another 2 years. Nominations are to be endorsed by Plenary ECFA. Members act as individuals, but should be able to represent the views of early-career researchers in particle physics in the nominating country.

→ Diversity in cultural background, career and research, try to represent the community
From PhDs to young assistant professors
Theoreticians, phenomenologists, experimentalists, …

3-4 panel meetings per year, handled by Organization Committee
Jan-Hendrik Arling, Holly Ann Pacey, Marko Pesut, Valentina Zaccolo
5 ECR delegates in Plenary ECFA
Lydia Brenner, Armin Ing, Andrea García Alonso, Holly Ann Pacey, Patrick Dougan
1 delegate in Restricted ECFA: Lydia Brenner

Activities in 2023

First large overhaul of members in 2023 (end of first two year term)
Draft of 2023 Activities Report found here

See arXiv:2212.11238 for a complete summary of 2021-2022 activities

Actual work is done in **working groups** that are flexible

Software and Machine Learning for Instrumentation WG

Main goals of the group

- Analysis of problems and challenges faced by early career researcher (connected to their software and machine learning work)
- Providing mechanisms to create a more friendly environment in which scientists receive substantive support in their self-development
- Organise school/workshop dedicated in software training/development for instrumentation work. The program would focus on:
  - training in Open Source Software, Data Acquisition Systems, Detector Control Systems
  - presentation of currently working groups related to software for future colliders

Ongoing survey of community

- Previous ECFA ECR surveying conducted in 2021 (arXiv:2107.05739) shows that 71% of 334 respondents indicated that their instrumentation work involved the use of open-source software tools, while 70% of 330 respondents said they had not received training for such tools.
- New survey currently circulating written by the WG asking about existing schools on instrumentation and how you we would like a future school to be designed
- Questions categorized by topic on Data Acquisition/Control Systems, Detector Electronics, Simulation, and Machine Learning.

Future Colliders WG

Role of ECRs for future colliders

“The future is ours" - Eliezer Rabinovici

Long time scales of future collider proposals mean that most researchers in charge of decisions now will not be around to build and operate the experiments and analyse their data.

ECRs have to shape their own vision of the future of our field

So which future collider do we want?

Future colliders WG

Goal: Inform ECRs about future collider options and development, enabling them to shape their own vision on future colliders

Future colliders for early-career researchers 27th of September 2023

Short presentations on prospects, lots of time for discussions. Can serve as reference information for ECRs.

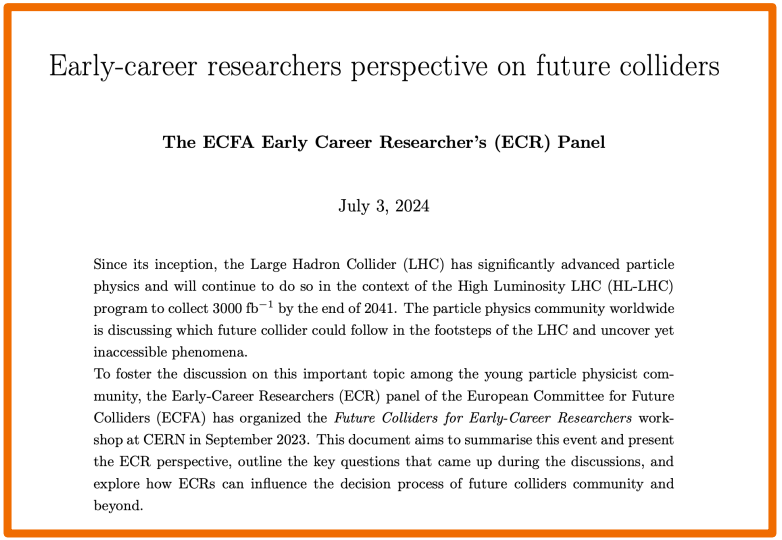
→ Almost 100 in-person participants, > 100 on Zoom

Future colliders WG

Goal: Inform ECRs about future collider options and development, enabling them to shape their own vision on future colliders

Future colliders for early-career researchers 27th of September 2023

Full written report on the topics discussed, consequences for ECRs and key messages added to arxiv yesterday arXiv:2407.01852



Early-career researchers perspective on future colliders

The ECFA Early Career Researcher's (ECR) Panel

July 3, 2024

Since its inception, the Large Hadron Collider (LHC) has significantly advanced particle physics and will continue to do so in the context of the High Luminosity LHC (HL-LHC) program to collect 3000 fb^{-1} by the end of 2041. The particle physics community worldwide is discussing which future collider could follow in the footsteps of the LHC and uncover yet inaccessible phenomena.

To foster the discussion on this important topic among the young particle physicist community, the Early-Career Researchers (ECR) panel of the European Committee for Future Colliders (ECFA) has organized the *Future Colliders for Early-Career Researchers* workshop at CERN in September 2023. This document aims to summarise this event and present the ECR perspective, outline the key questions that came up during the discussions, and explore how ECRs can influence the decision process of future colliders community and beyond.

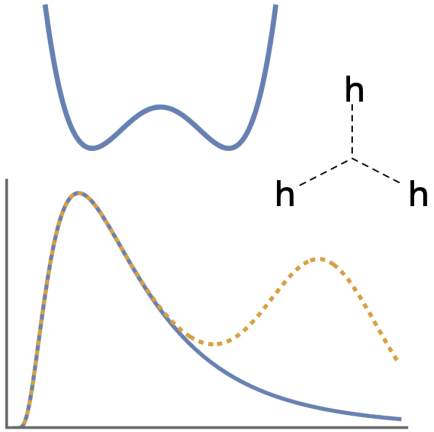
Key message 1: Communicating need for future colliders

Summary

Exciting times ahead if a future collider is built!

- Guaranteed deliverables:
  - Precision measurements
  - Higgs self-coupling
- Potential direct discoveries

Anke Biekoetter



There are guaranteed discoveries!

- Learn how to communicate importance of precision

Future colliders are worth it

- For science and society

See sustainability not as a concern but as a challenge

- To develop technologies relevant for society

Key message 2: Enabling careers on future colliders

It's a long time until any future collider is operational

- Take future collider decision as early as possible
  - To give ECRs a concrete goal and timeline
  - To ease applying for grants
- Long-term R&D projects and support for careers in instrumentation
  - DRD Collaborations look very promising!
- Important for ECRs to broaden their horizon
  - Projects such as ECN3 very attractive to complement future collider work

What's next?

Use our voice

- ECFA ECR Panel authored an open **letter to CERN Council** urging an acceleration of the timescale of decision making for the next European Strategy (see Appendix of the report "Early-career researchers perspective on future colliders")
- We were pleased to see our voice heeded in the changing of schedule

Spread the word

- Armin Ilg presented the workshop outcome at the CALICE ECR meeting
- Emanuele Bagnaschi presented the workshop outcome at the Second e^+e^- Higgs/EW/top factory in Paestum, incl. ECR panel discussion

From ECFA to the national communities

- Goal is to follow-up the ECFA-wide event with national, in-person events on future colliders, directing discussions into the ECFA countries as some issues are country dependent
- National contributions to the European Strategy a great opportunity for ECRs to help make physics case for potential future projects

Future colliders WG

Follow up events are being planned in (nearly) all countries, many using blueprint produced based on 2023 CERN event. Some 2024 workshops:

Nordic Future Collider day in May at Lund (over 50 attendees)

Belgium + The Netherlands workshop this coming September

Young Nordic Future-Collider day / FCC discussion

Tuesday 14 May 2024, 10:00 → 18:00 Europe/Zurich

Lundmarksalen (Lund)

Bernhard Meirose (Lunds Universitet) , Christina Dimitriadi (Uppsala University (SE), University of Bonn (DE)) , Erik Wallin (Lund University) , Magdalena Vande Voorde (KTH Royal Institute of Technology (SE)) , Rebeca Gonzalez Suarez (Uppsala University (SE))

Description In connection with the RECFA visit to Sweden this May, we are happy to invite you to the Young Nordic Future-Collider Day! This half-day event, organised by the ECFA early-career researcher (ECR) representatives of Sweden, Denmark, and Finland, aims to provide a broad overview of future colliders and foster discussions among young scientists on this important subject!

In the agenda we have a set of overview talks of topics related to future colliders, ECRs and Nordic activities, followed by a panel discussion. After the panel, there will be a more focused discussion on FCC organised by Sweden's ECFA delegates.

While we highly encourage in-person participation, we understand that everyone's availability and preferences may vary, therefore the event will be hybrid and participation via Zoom is possible. Although the workshop is targeting ECRs, senior colleagues are more than welcome to attend and actively engage in the discussions!

If you intend to attend the event in person please register by the 5th of May, so we can order the right amount of fika 🌟

LundmarksalenMa... Photo.png

Registration Registration Register

Participants Craig Wiglesworth, Henning Kirschenmann, Johan Bijnens, Magdalena Vande Voorde, Mikael Myllymaki +52

Future colliders for early-career researchers. Belgium and The Netherlands

12–13 Sept 2024
Ghent
Europe/Brussels timezone

Enter your search term

- Overview
- Call for Abstracts
- Timetable
- Contribution List

The ECFA ECR representatives of the Netherlands and Belgium organise a workshop to discuss the topic of future colliders to the individual ECFA member countries. This event is created to foster discussions in both countries and to provide input towards the next update of the European Strategy for Particle Physics, which is extremely important, especially for ECRs. Many aspects such as funding and career paths of ECRs are country-specific, but largely overlap between Belgium and the Netherlands, which is why we chose to combine these two countries.

Organising Committee

Future colliders WG

Follow up events are being planned in (nearly) all countries, many using blueprint produced based on 2023 CERN event. Some 2024 workshops:

First ECFA-INFN Early Career Researchers meeting @LNF-INFN, Frascati, yesterday

70 participants (50 in person) with plenary talks about colliders (FCC, μCol, EIC,...) + time for discussion between ECR

Career Prospects and Diversity in Physics programmes WGs

Career Prospects and Diversity in Physics Programme WGs

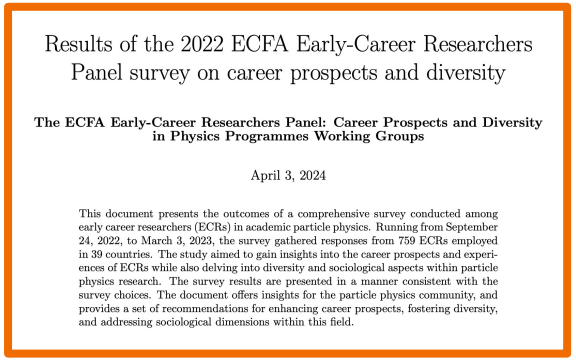
Designed a survey to collect information about…

- The impact of the collaboration and institute work enviroments on ECRs
- Assess the career prospects of ECRs: how can our panel help, what are the main problems?

Circulated to ECR community ☞ 760 responses!

- ~ 50% of the respondents were employed in Northern Europe , ~ 25% in Mediterranean Europe and ~ 15% in Central and Eastern Europe
- ~ 1/3 of the respondents were Mediterranean, ~ 1/3 from Northern Europe and ~ 1/5 from Central and Eastern Europe
- ~50% on 36–47 months or 24–35 months contracts
- Almost half were aged between 26 and 30

Responses have been analysed and written report published on arxiv https://arxiv.org/abs/2404.02074



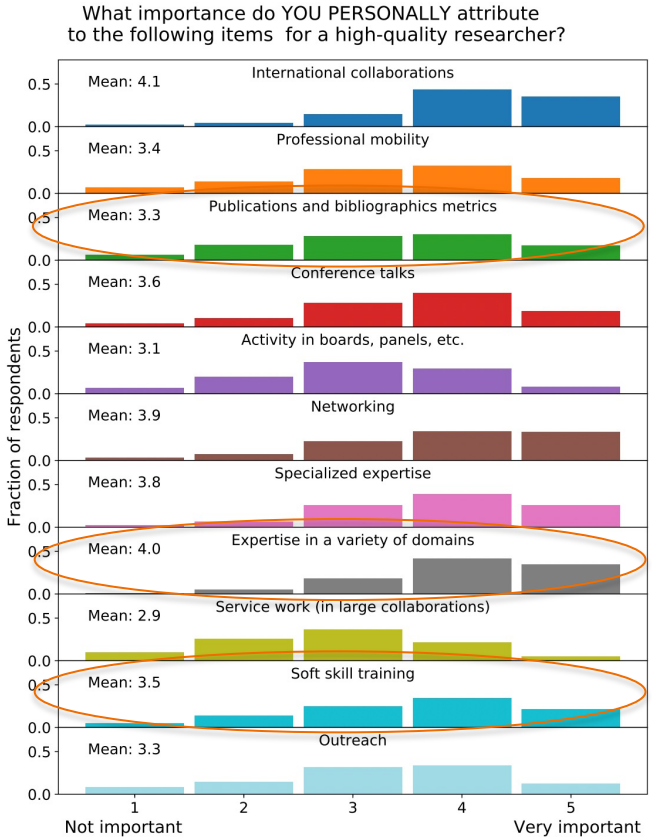
Results of the 2022 ECFA Early-Career Researchers Panel survey on career prospects and diversity

The ECFA Early-Career Researchers Panel: Career Prospects and Diversity in Physics Programmes Working Groups

April 3, 2024

This document presents the outcomes of a comprehensive survey conducted among early career researchers (ECRs) in academic particle physics. Running from September 24, 2022, to March 3, 2023, the survey gathered responses from 759 ECRs employed in 39 countries. The study aimed to gain insights into the career prospects and experiences of ECRs while also delving into diversity and sociological aspects within particle physics research. The survey results are presented in a manner consistent with the survey choices. The document offers insights for the particle physics community, and provides a set of recommendations for enhancing career prospects, fostering diversity, and addressing sociological dimensions within this field.

Career Prospects and Diversity in Physics Programme WGs

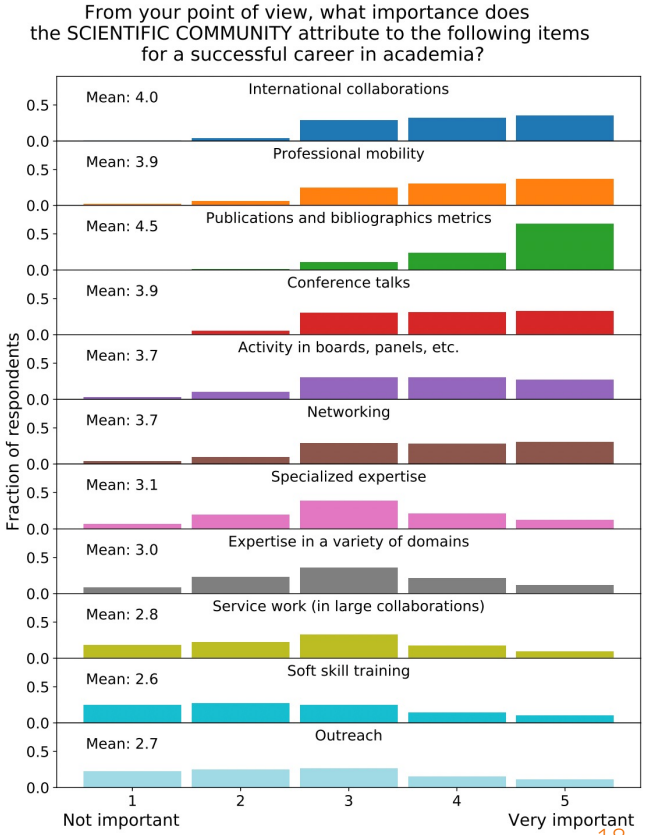


What do ECRs *think* is:

needed to be a **good researcher**

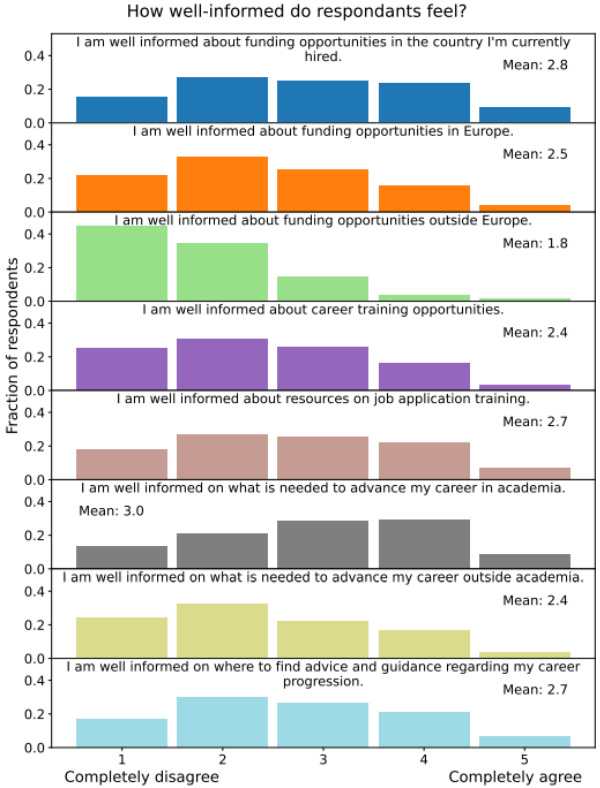
versus

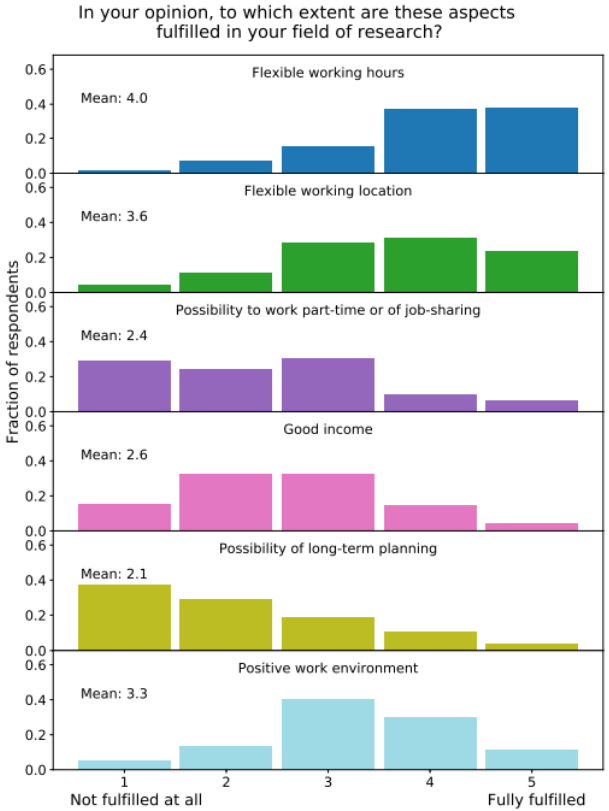
needed for a **successful career**?



Career Prospects and Diversity in Physics Programme WGs

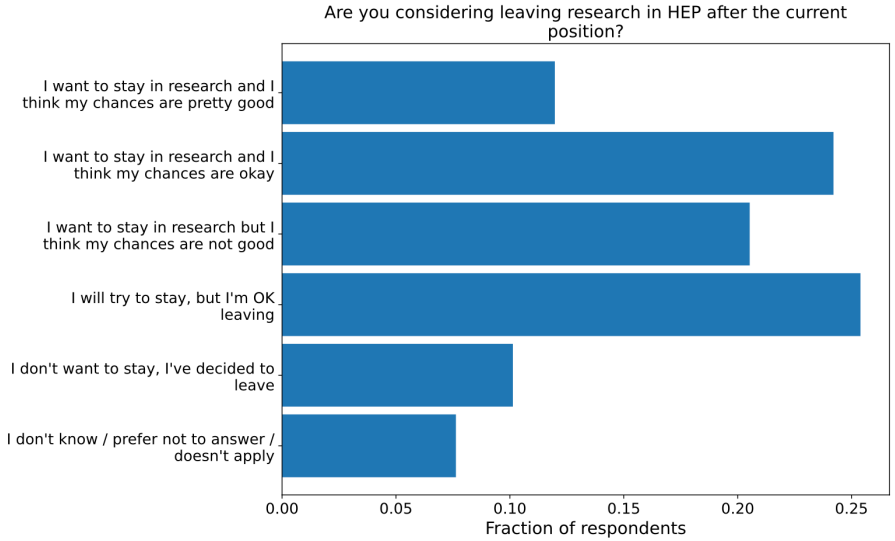
- ECRs **not** as well-informed about training / **opportunities** as they could be.
- ECRs feel some aspects important to **work-life** balance are **unfulfilled**.

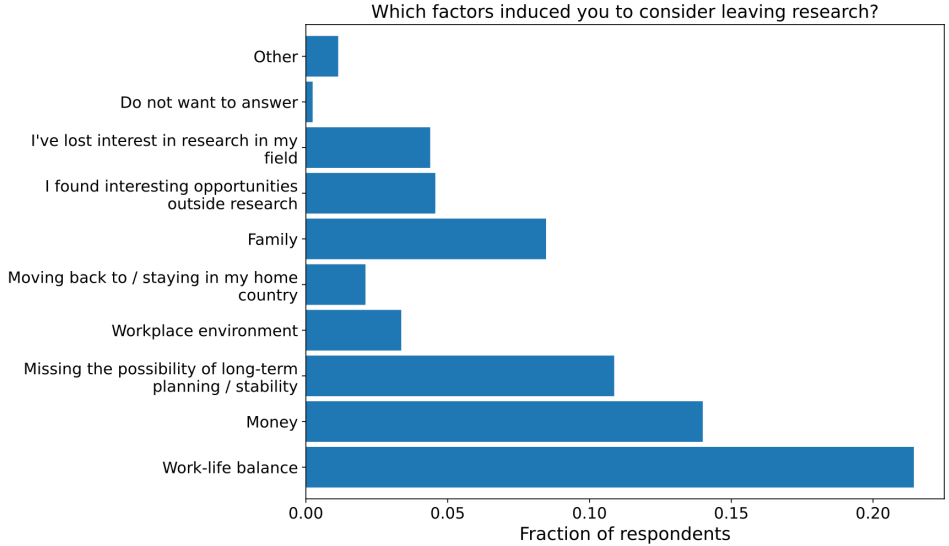




Career Prospects and Diversity in Physics Programme WGs

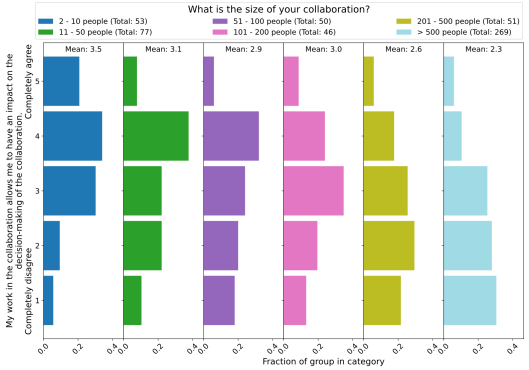
- Consistent conclusion that **lack of job stability** and **poor work-life balance** are the biggest challenge for ECRs and the main cause of them considering **leaving** research.

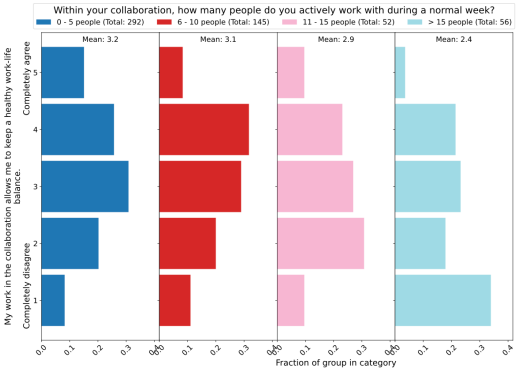


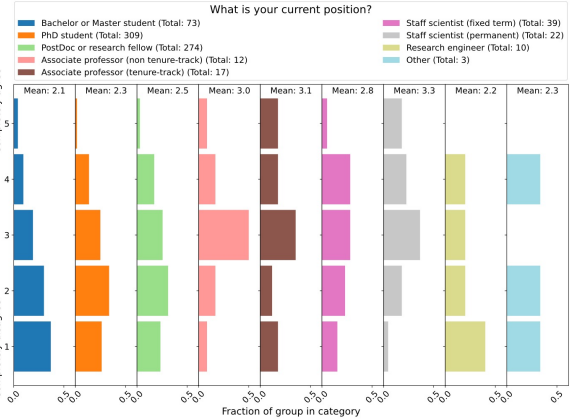


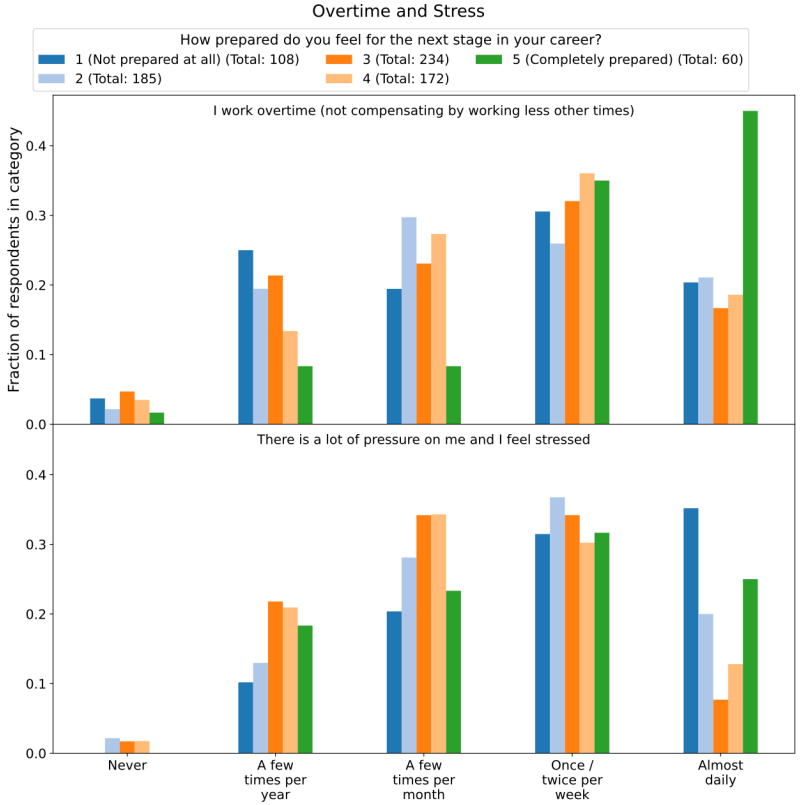
Career Prospects and Diversity in Physics Programme WGs

- Full report features extensive correlation analysis









Career Prospects and Diversity in Physics Programme WGs

- Appendix of direct quotations submitted in response to the survey also included

“the prospect of moving to a different country every 2-3 years to maybe then get a permanent position when I’m forty. Considering the amount of doctoral candidates and the amount of permanent positions, it is quite likely that I won’t get a permanent position anyways, so I might just leave straight away”

“Current post-doc challenges forces people to live super uncertain lives for uncertain duration. This needs to be addressed for our field to continue as all works rely on post-docs.”

“I think there needs to be a general shift in the way senior scientists think about recognition. Recognition is currently based on how well a student/postdoc networks with senior scientists to get “high-quality” reference letters.”

“The academia in general has taken up false values including hyper-mobility, career uncertainty, poor compensation and maximisation of the number of publications. Some of these issues interfere making things even worse. The issues have gotten worse as ”business logic” has been brought to academia - without proper compensation or definition of working hours, not to speak of uncertain career prospects. A complete reform is in place, but not in sight.”

Career Prospects and Diversity in Physics Programme WGs

- National events being run in response to issues highlighted around careers in the survey
- e.g. recent UK ECR careers event around applying for fellowships and moving to industry, providing insights from ECRs with fellowships, senior academics who sit on hiring panels, as well as those who have moved from HEP to industry

PPAP Community Meeting

24–26 Jun 2024
University of Birmingham
Europe/London timezone

- Overview
- Timetable
- Registration
- Participant List
- ECR UK HEP-ex Jobs event

ECR UK HEP-ex Jobs event

In association with the IoP and the annual PPAP community meeting later this month, the UK ECFA ECR panel is organising a UK Industry and Academic Jobs Event for HEP-ex ECRs. Part of the feedback from our ongoing UK ECR survey (there's still time to fill out this important survey: https://forms.gle/WKGqSxAfWGSnNoeF6 please!) was clear demand for an event to help ECRs navigate the path from PhD to Postdoc, Postdoc to Fellowship, and Academia to Industry. This half-day event will feature an introduction to the HEP-experiment jobs market in the UK, followed by a series of audience-driven Q&A discussions with:

- ECRs who have recently succeeded in acquiring Postdocs, Fellowships & Permanent positions in the UK [Panellists: Kirsty Duffy, Jay Howarth, Daniel Hynds, Matt Kenzie, Sarah Williams, Dan Johnson and Estifa'a Zaid]
- Senior academics who have sat on UK hiring/fellowship committees [Panellists: Jon Butterworth, Monica D'Onofrio, Dan Tovey, Melissa Uchida, Dave Newbold, Beate Heinemann and Nigel Watson]
- Former HEP physicists who have made successful transitions from academia into industry [Panellists: Karola Bejm (Elmos Semiconductor), Jon Burr (Mathworks), Alix Fell (Multiverse), James Grundy (Civil Service), Martha Hilton (IOP/UKRI), Mike Nelson (Keyrock)]

12:00	**Intro** *Physics West Building, room W117 / Lecture Theatre, University of Birmingham*	12:00 - 12:05
	UK HEP-ex Careers 101 *Physics West Building, room W117 / Lecture Theatre, University of Birmingham*	12:05 - 12:35
	Recent Hires Survey results *Physics West Building, room W117 / Lecture Theatre, University of Birmingham*	12:45 - 12:55
13:00	**Lunch** *Room 125 Vinen Room, University of Birmingham*	13:00 - 13:50
	Academia -> Industry Panellist introductions *Physics West Building, room W117 / Lecture Theatre, University of Birmingham*	13:50 - 14:15
14:00	**Panel: Academia -> Industry Perspectives** *Physics West Building, room W117 / Lecture Theatre, University of Birmingham*	14:15 - 15:10
	Refreshments break *Physics West Building, room W117 / Lecture Theatre, University of Birmingham*	15:10 - 15:30
15:00	**Panel: ECR Perspectives** *Physics West Building, room W117 / Lecture Theatre, University of Birmingham*	15:30 - 16:25
16:00	**Panel: Senior Perspectives** *Physics West Building, room W117 / Lecture Theatre, University of Birmingham*	16:30 - 17:25
	Closeout *Physics West Building, room W117 / Lecture Theatre, University of Birmingham*	17:25 - 17:30
17:00		

Concluding words

Young panel with young people

- Panel has self-organised and is active with several working groups
- Just had our first large member renewal
- Active engagement with the ECR community on **national level**, beginning to shape response to concerns raised
- There are many issues to be addressed for ECRs, both now and in the long-term. The engagement of our senior colleagues is essential securing a strong future for our ECRs, who are the future of HEP

Keep in touch with us

- Our webpage to find your country ECR representative
- ecfa-ecr-organisers@cern.ch
- Subscribe to ecfa-ecr-announcements e-group to get notified about our activities!

Draft of 2023 activities will soon be on arxiv, will continue updates in the PECFA meetings and ECFA newsletter!

Thanks!

Back up

CZ/SK ECR Future Collider Meeting

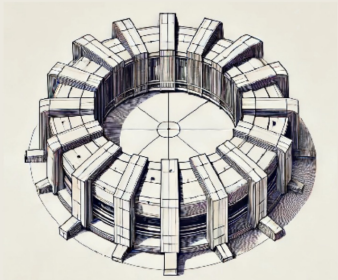
- Follow up from CK Meeting in 2023 (Agenda left) which focused on careers and funding
- Meeting in September focus on Future Colliders to engage ECR community

Timetable

Tue 30/05

Print | PDF | Full screen | Detailed view | Filter

10:00	ECFA ECR	B-103, Prague, Brehova 78/7 10:00 - 10:50
	Coffee break	B-103, Prague, Brehova 78/7 10:50 - 11:00
11:00	Career	B-103, Prague, Brehova 78/7 11:00 - 12:45
12:00		
13:00	Lunch	B-103, Prague, Brehova 78/7 12:45 - 14:00
14:00	Funding	B-103, Prague, Brehova 78/7 14:00 - 15:30
15:00	Coffee break	B-103, Prague, Brehova 78/7 15:30 - 15:45
	Career	B-103, Prague, Brehova 78/7 15:45 - 16:10
16:00		



Future Colliders for Early-Career Researchers: CZ/SK Edition

27 September 2024
MFF UK Troja
Europe/Prague timezone

Enter your search term

- Overview
- Timetable
- Registration
- Participant List

Contact
ecfa-ecr-cz-representati…

In 2020, the CERN council approved a significant update to the European Strategy for Particle Physics, emphasising the development of an electron-positron Higgs factory as the top priority for the next collider. With ongoing global studies on this and other collider projects, and the next strategy update approaching in 2026-2027, it is vital for young researchers to actively participate in shaping the future of our field.

With this in mind, we are organising a one-day workshop to introduce Early Career Researchers (ECRs) to the future-collider proposals currently under consideration. This event aims to help young researchers form informed opinions about these important projects and to encourage discussions within the ECR community on this topic.

The workshop is organised by the Czech and Slovak ECR representatives in Prague. On-site attendance is recommended. Registration is open now, please complete the registration process at your earliest convenience.

This workshop is intended for all students, postdocs, and young researchers in the field of high-energy particle physics. It will be an opportunity for you to voice your interests, concerns, and suggestions regarding the direction of our field, and to learn how you can contribute to shaping its future.

Letter to CERN Council

Appendix A

Dear CERN Council,

In the 70 years since its founding, CERN has not only established itself as the global centre of particle physics research but as a powerful symbol of international collaboration and scientific excellence. This would never have been possible without the unfaltering support offered by the CERN member states.

As a community, we feel immense pride and gratitude that we are part of this journey of scientific exploration and opportunity which CERN has pioneered. While the High-Luminosity LHC constitutes a much-anticipated and necessary advance in the LHC program, a clear path beyond it for our future in the field must be cemented with as little delay as possible. For the field to sustain the population, expertise, and enthusiasm required to overcome the challenges of what CERN's next major project/accelerator will present, the ECR community needs certainty without delay that High Energy Physics has an immediate future beyond HL-LHC, and that funding and positions required to realise our future will grow rapidly.

We, the ECFA Early-Career Researchers Panel, on behalf of the ECR community, would like to strongly urge the Council to make every effort to ensure that the process of evaluating, selecting and implementing potential future projects, which will define this century of High Energy Physics for Europe and the World, proceed with as quick a pace as possible, accelerating its time frame to start the European strategy process as early as possible and conclude by early 2026. This will go some way in helping further secure CERN's unique position in science, technology and international cooperation for the next 70 years and beyond.

Kind regards,

The ECFA Early-Career Researchers panel

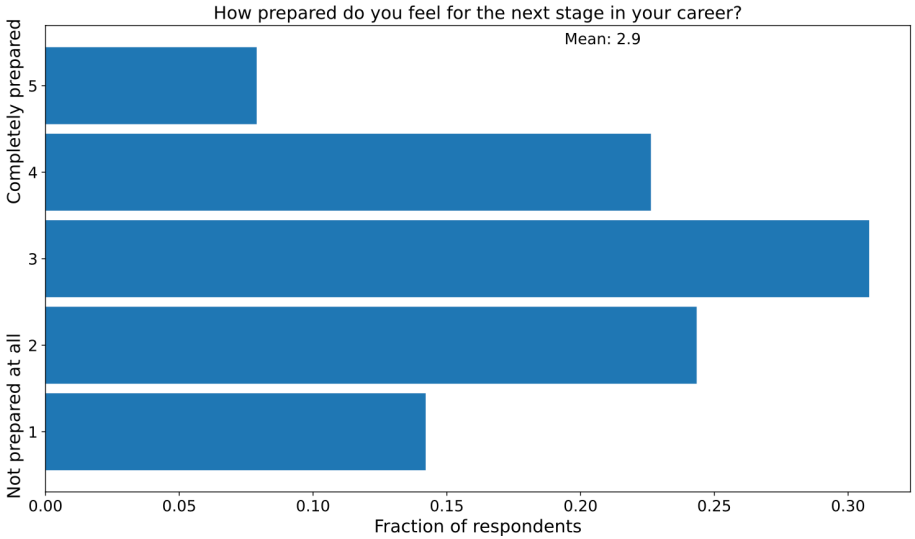
What are the considerations for choosing the next step

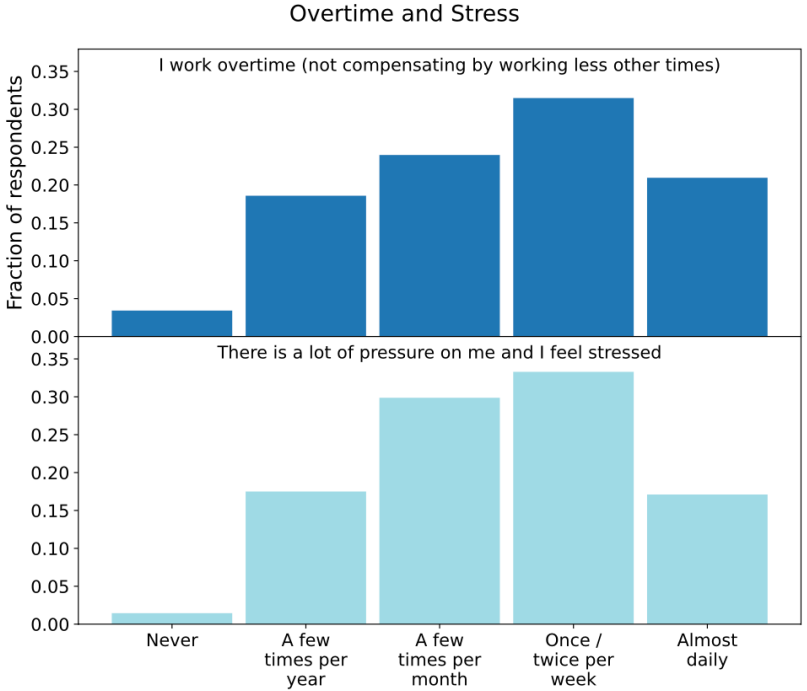
What do **WE** (the ECR community) find most important in the considerations for a next collider

We will not pick the next collider today, but we ask the questions that need answering:

- What are the physics questions we want answered?
- How can we make sure that the probable physics is diverse enough?
  - Are several smaller colliders preferable over one large collider for the physics program diversity?
- What are the upgrade possibilities of proposed projects?
- How precise can we get, taking realistic improvements in theory predictions into account?
- How can we make sure the collaboration with other energy range experiment is ensured?
- Is the future collider programme compatible with ECR careers considering large time gaps after HL-LHC?
  - Would/could muon colliders make it in time to follow the HL-LHC?
- Can we bridge the gap between HL-LHC and a large future collider with enough attractive projects?
- How can we make a next collider is sustainable in terms of energy use?
- At what time-scale should the ECR community dedicate itself to one particular proposal?
- How can ECRs make the impact they desire on the decision making process?

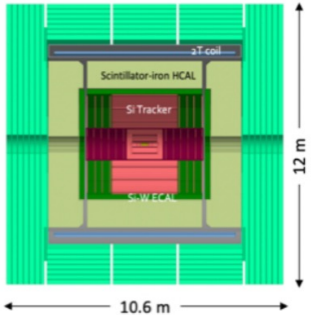
More Careers Survey Results from Correlations





Key message 3: Knowledge transfer and collaboration

CLD



https://arxiv.org/abs/1911.12230 and FCC CDS vol. 2

Well established design
- ILC -> CLIC detector -> CLD

Full Si vtx + tracker; CALICE-like calorimetry; large coil, muon system

Engineering and R&D needed for
- reduction of tracker material budget
- operation with continous beam (no power pulsing: cooling of Si sensors for tracking + calorimetry)

Possible detector optimizations
- Improved σ_p/p, σ_E/E
- PID: timing and/or RICH?

- Had participants from all future collider communities at our workshop
  - Open and creative exchange of ideas beyond various borders
- Future collider R&D is highly transferable from one collider proposal to another (and beyond)
  - Good ideas will survive a collider or two…

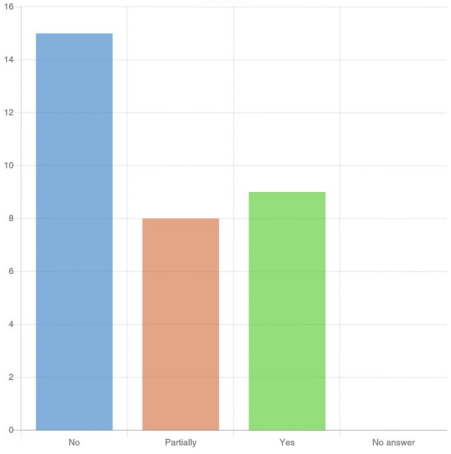
Good reasons for everyone to work on future colliders!

And even muon collider now!

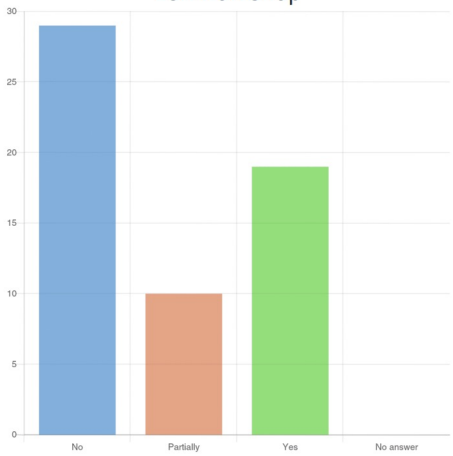
CERN and ECR Workshop survey (full presentation here)

- Are you currently working on projects connected to future colliders?

CERN



ECR workshop

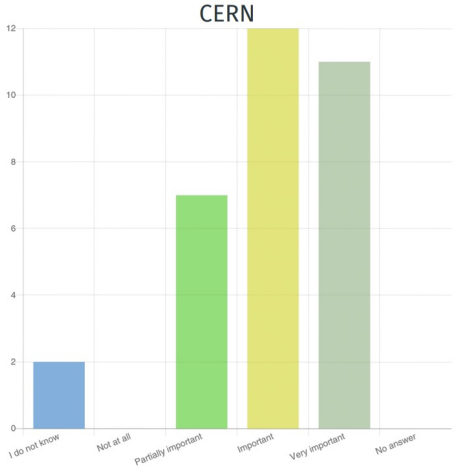


- Majority already working (partially or fully) on future collider projects

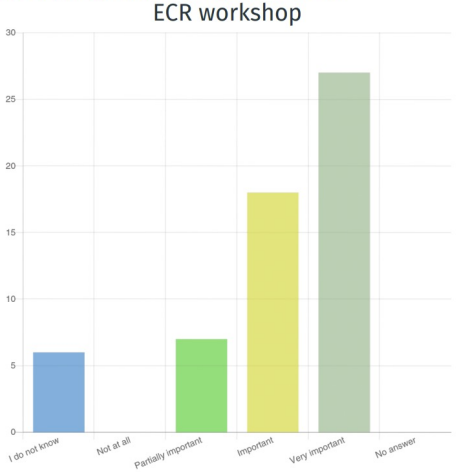
- Majority already working (partially or fully) on future collider projects

- How important is the future collider programme for your career?

CERN



ECR workshop



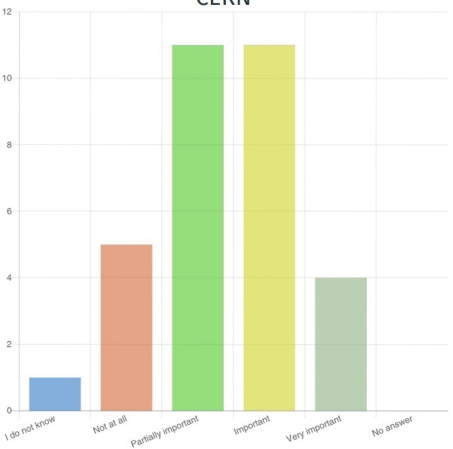
- A future collider program is considered important by (almostt) everyone

- A future collider program is considered important by (almost) everyone

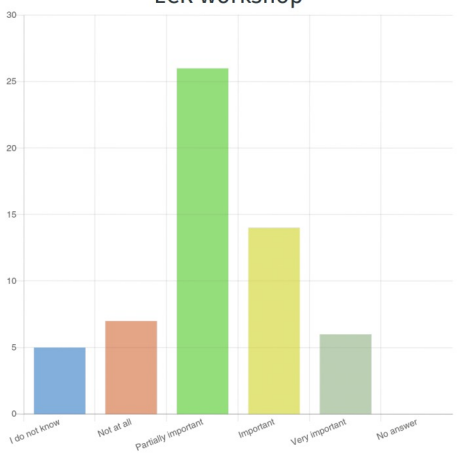
CERN and ECR Workshop survey (full presentation here)

- Is the choice of a specific future collider over another important for your career?

CERN



ECR workshop

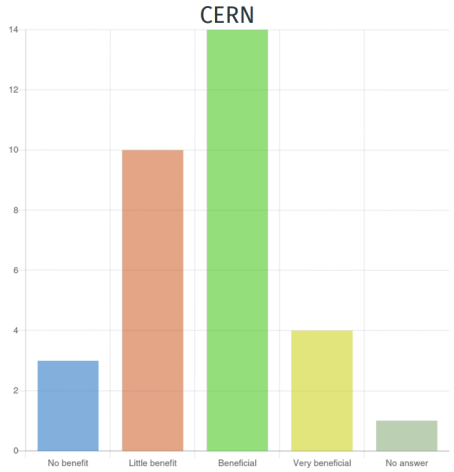


- The choice of the collider seems to matter, in part or completely

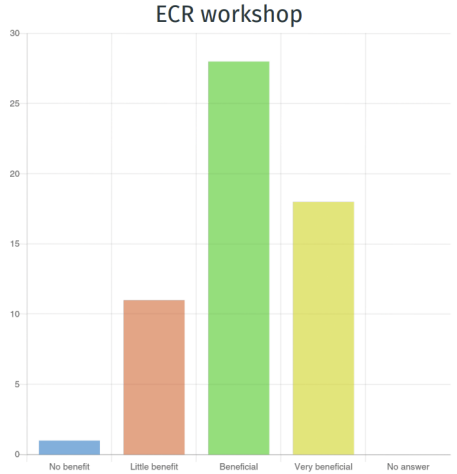
- The choice of the collider seems to matter, in part or completely

- Do you consider including future-collider related projects in your activities as beneficial to your career?

CERN



ECR workshop

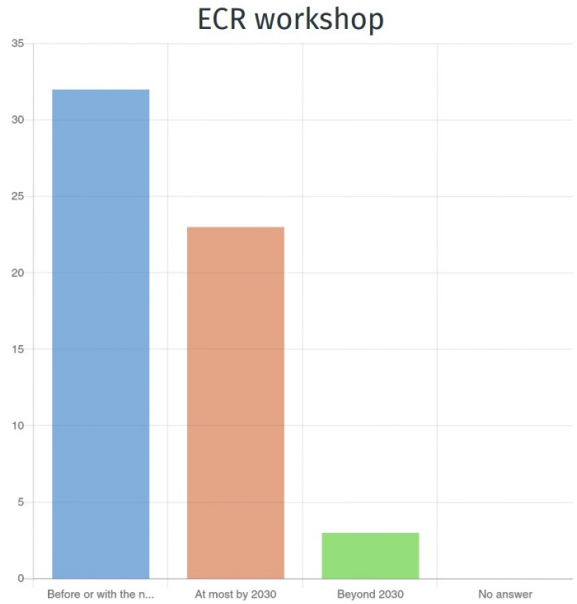


- Sizable 'little benefit' choice

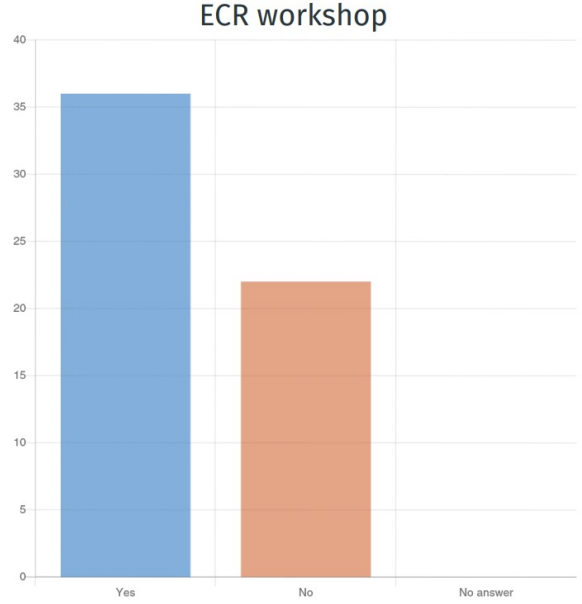
- More positive outlook

CERN and ECR Workshop survey (full presentation here)

In light of your career prospects, how long do you think it is acceptable to wait before the decision of which machine to build is made



Would you accept to work nearly full time on a project connected to a future collider, while the decision on the next machine is still pending? If yes, under which conditions



The agenda of Future colliders for early-career researchers, 27th of September 2023