



Scientific inclusion at Fermilab

Nhan Tran, Kristine Radke, Sophia Corona + discussions with many others
Jan 25, 2024

Overview

Goal: improve inclusion and career paths for “non-Scientist” mission people

Outline:

- Why, My role, and Who?
- Observations
- Next steps

Why and who?

A good starting point - P5 SLAC town hall talks

[Cindy Joe](#),
[Erin Hansen](#)

Non-Physicists in the HEP Community: Inclusion, Recognition, and Valuing their Contributions

Cindy Joe
P5 Town Hall at SLAC
May 4, 2023

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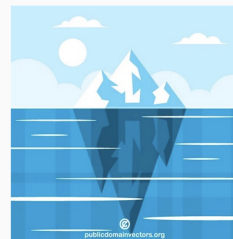
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Who participates
in science?

They want the
same things

Physicists
Technicians
Engineers
Operators
Support staff
(and more...)



Scientific discovery
Pride in their work
Recognition
Respect
Compensation
Feeling of belonging to community,
that their contributions matter

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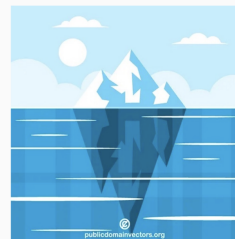
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- Climate of the Field: Snowmass 2021,
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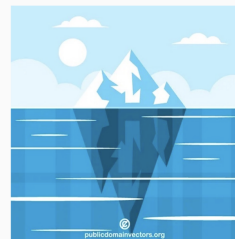
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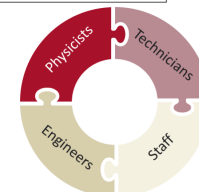
Institutions Collaborations Non-Scientists HEPA Software Throughlines

Scientists & non-Scientists: Participatory Injustice

Young technicians, engineers, operators, and physicists will experience very different levels of support, inclusion, mentorship, recognition, professional development, and opportunities of all kinds over their careers, and this divide continues and its cumulative effects multiply over the years.

"Essential" technical and operational staff often found themselves vitally needed and completely forgotten at the same time.

There are times when certain "scientist"/ "non-scientist" distinctions are important and useful; but there are other times when this artificial caste system mainly serves to hurt communication, productivity, and morale.



Who is purposefully included?

- Email lists
- Slack / Communication platforms
- Authorship
- Social events
- Codes of Conduct

Recommendation 5

The following workforce initiatives are detailed in section 7:

- a. All projects, workshops, conferences, and collaborations must incorporate ethics agreements that detail expectations for professional conduct and establish mechanisms for **transparent reporting, response, and training**. These mechanisms should be supported by laboratory and funding agency infrastructure. The efficacy and coverage of this infrastructure should be reviewed by a HEPAP subpanel.
- b. Funding agencies should continue to support programs that **broaden engagement** in particle physics, including strategic academic partnership programs, traineeship programs, and programs in support of dependent care and accessibility. A systematic review of these programs should be used to identify and remove barriers.
- c. Comprehensive **work-climate studies** should be conducted with the support of funding agencies. Large collaborations and national laboratories should consistently undertake such studies so that issues can be identified, addressed, and monitored. Professional associations should spearhead field-wide work-climate investigations to ensure that the unique experiences of individuals engaged in smaller collaborations and university settings are effectively captured.
- d. Funding agencies should strategically increase support for **research scientists, research hardware and software engineers, technicians, and other professionals** at universities.
- e. A plan for **dissemination of scientific results to the public** should be included in the proposed operations and research budgets of experiments. The funding agencies should include funding for the dissemination of results to the public in operation and research budgets.

What's next?

These talks were great at Snowmass/P5, but how do we turn them into actionable change? **Fermilab can lead by example**

There has been general sentiment in the field to support hardware/computing specialists more but their job prospects are less valued (culturally, compensation)

Example: new DPF/NSF instrumentation fellowships

At Fermilab, there is strong cultural language around “Scientist” (all-*scientist* meetings, *scientific* advisory committee) but it’s not obvious who that encompasses

- “Scientist” really means “Physicist” - people doing non-HEP science have a different title (computer science, AI research, engineering research, etc.)
- (*I also realize this is probably an issue worth tackling*)

Where I'm coming from

Was in PPD (Postdoc, then Wilson Fellow) for 8 years; CMS, LDMX, SpinQuest/DarkQuest

In 2019, moved to SCD to lead AI initiative

Now: Real-Time Processing Systems Division Director, Scientist

My division primarily includes:

- computing professionals, engineers (associates), applications/engineering physicists, technicians
- Also as AI project office lead, run the AI associate program

Have experienced unhappiness with some division members

- Lost one two person(s) already

Goal: improve “non-scientist” career experience and job path

- **(from Cindy Joe:) Better retention and recruitment, higher quality and happier workforce, better science**

Who?

We are talking about a **significant** fraction of the mission side folks at Fermilab

Practically, let's start with **Application Physicists and Engineering Physicists** (AP/EP) because this job family is:

- close to Scientist job family (more later)
- Planned for HR review this year

From the CSAID point of view, a large fraction of computing professionals (**RSEs, research software engineers**) are in a very similar position

Count of Fermiworks ID	Column Labels					Grand Total
Row Labels	AD	APS	CSAID	ETD	PPD	Grand Total
Administrative & Management	15	19	5	11	17	67
Clerical & Secretarial	8	7	1		12	28
Computer Professionals	45	3	86	2	4	140
Computer ProfessionalsEngineers					1	1
Drafters	14	10			4	28
Engineering Physicists	50	18	11	5	24	108
Applications Physicist I	2		2	1	5	10
Applications Physicist II	7		5	1	5	18
Applications Physicist III	5		3	2	2	12
Engineering Physicist I	5			1	4	10
Engineering Physicist II	6	7	1			14
Engineering Physicist III	7	5			2	14
Engineering Physicist Mgr	7	3			3	13
Sr Engineering Physicist	11	3			3	17

The things being discussed are equally relevant to other job types (technicians, operators, etc.)

Observations

Collecting input

Thus far, Nhan and Kristine have exchanged ideas and discussed with and interviewed stakeholders and APs/EPs to get their input

- Also have discussed with compensation and other HR partners in other directorates; similar sentiments reported

What we've done is anecdotal, but still valuable

- More specific to Fermilab organization/culture
- Corroborates Snowmass report
- Compare with climate survey?

Thoughts & Sentiments

Engineering Physicist:

“Your peers are grad students/
postdocs who have help launching
their careers, but you’re navigating
on your own.”

“Feeling as though you’re
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Anonymous:

“One of the main reasons I want to leave is because I don’t see how I can grow here....”

Example: Wine and Cheese

Today's wine and cheese seminar

To: engineers_all <engineers_all@fnal.gov>, fermi_scientists <fermi_scientists@fnal.gov>,
SCIENTIST-EMERITI <SCIENTIST-EMERITI@listserv.fnal.gov>, all-fspa <all-fspa@fnal.gov>

How is this mailing list defined? Why is it restricted?

Example: SAC

The Scientist Advisory Council (SAC) is ...

...

P.S.,

Eligibility for SAC is not limited to “Scientist” job title. Application Physicists have been on SAC, and we imagine Computer Science Researchers are eligible, too. Engineers, though, have a parallel system.

I appreciate that there is an effort to make things more inclusionary but the fact that it's unclear and this has to be stated/clarified is a potential issue.

Promotion/mentorship

No one follows the promotion path of AP/EPs – at the judgment of your line manager or division director (who may not know the history or background of the person)

There is no uniformity - this often creates lack of urgency and accountability

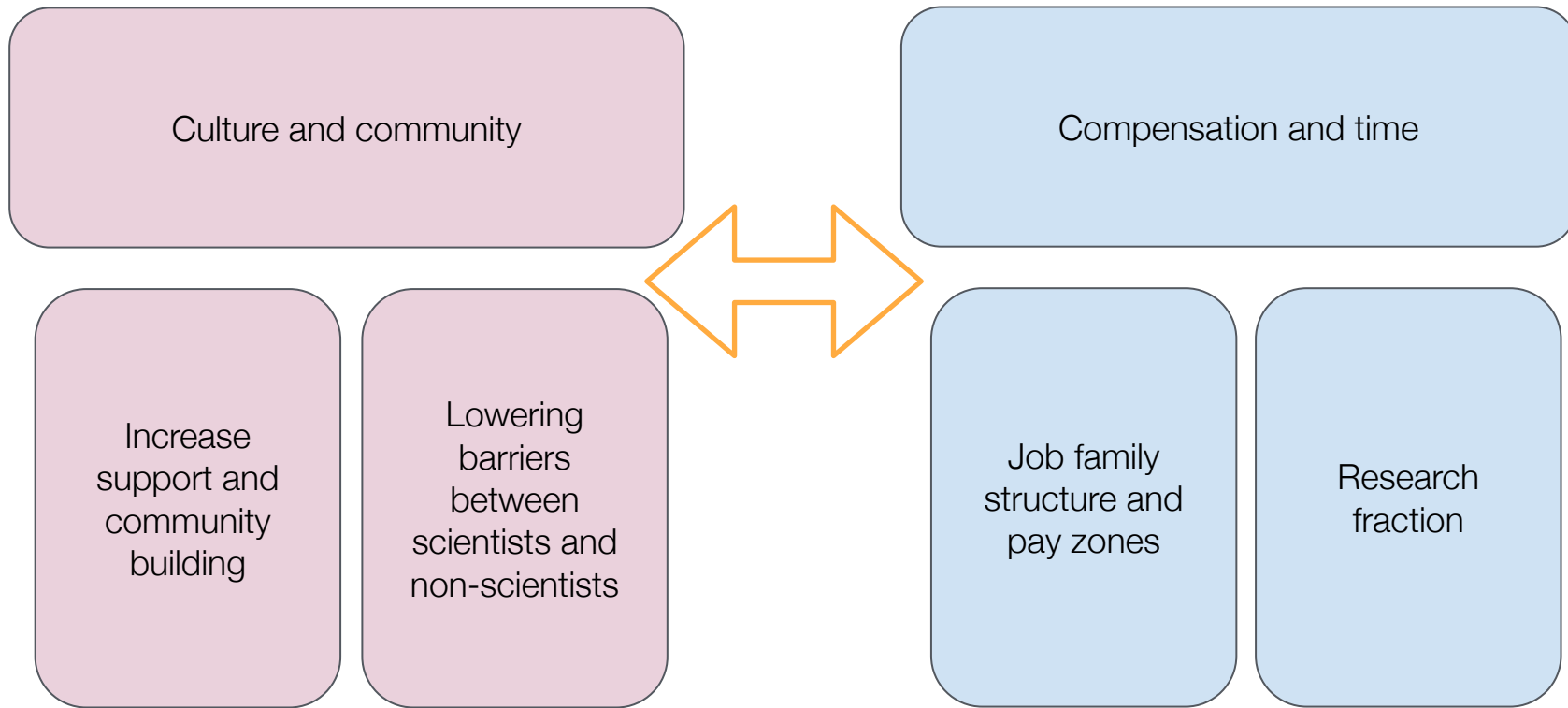
While I'm not suggesting FCSA for AP/EPs, some (more) coordination is necessary

Next steps

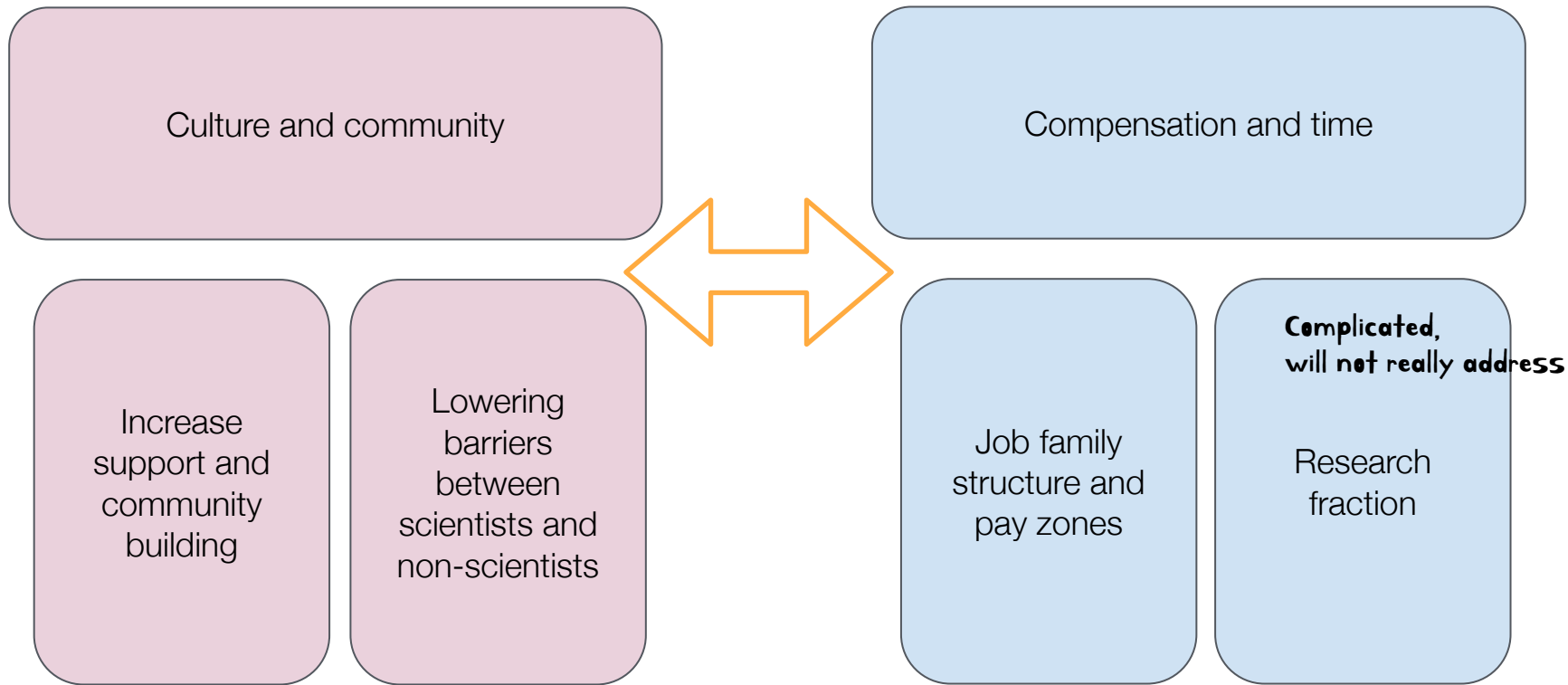
Historical Aside

- Had a very nice conversation with Mike Lindgren (now retired)
- Led the creation of Applications Physicist job family (~2016/17)
 - Scientist job family used to include Applied Scientist I/II
 - Split off to create Applications Physicist I/II/III/IV
- Motivations *at that point* were are aligned with the points being discussed here - more inclusion and growth opportunity for more technically-focused career paths
- Important point: did not “close the deal culturally” in the creation of the job family
 - That has led to the job family evolving into something different in 2024

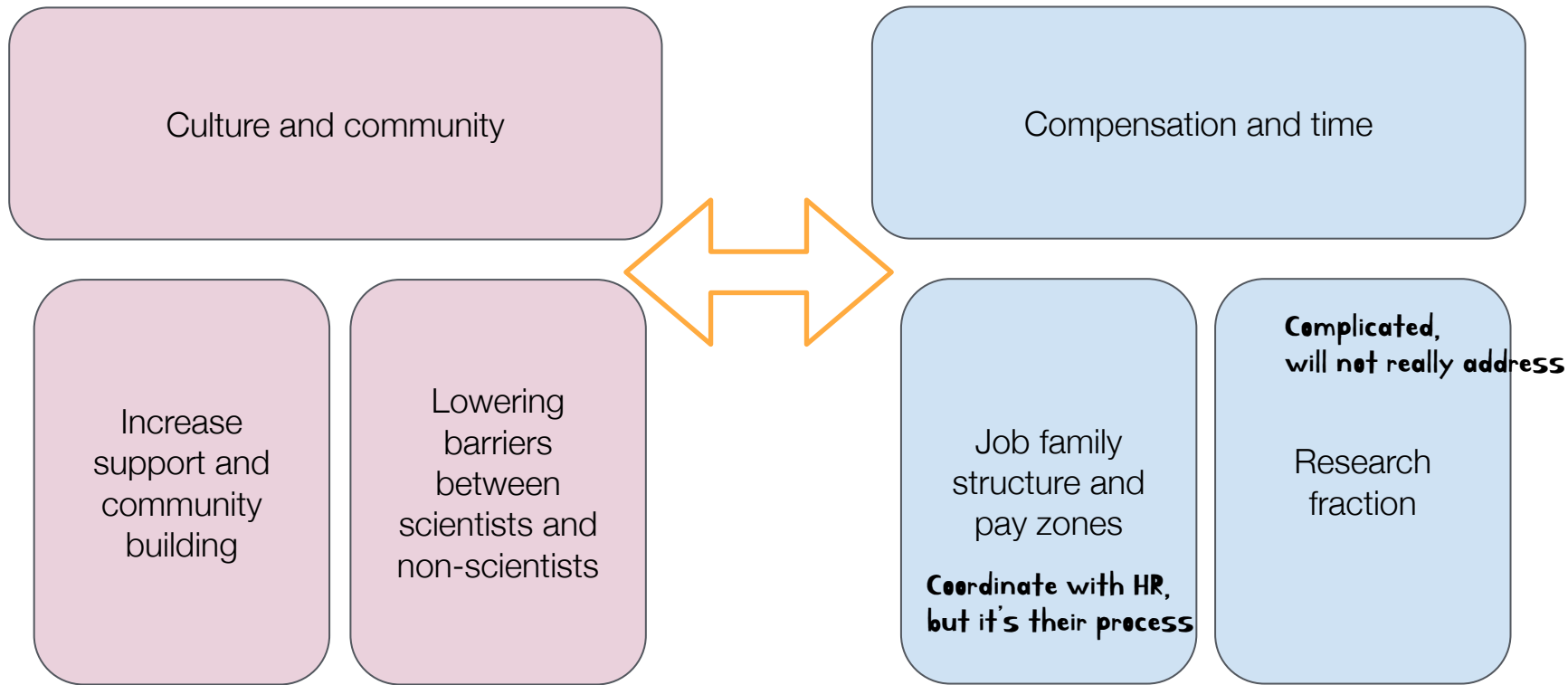
Towards change



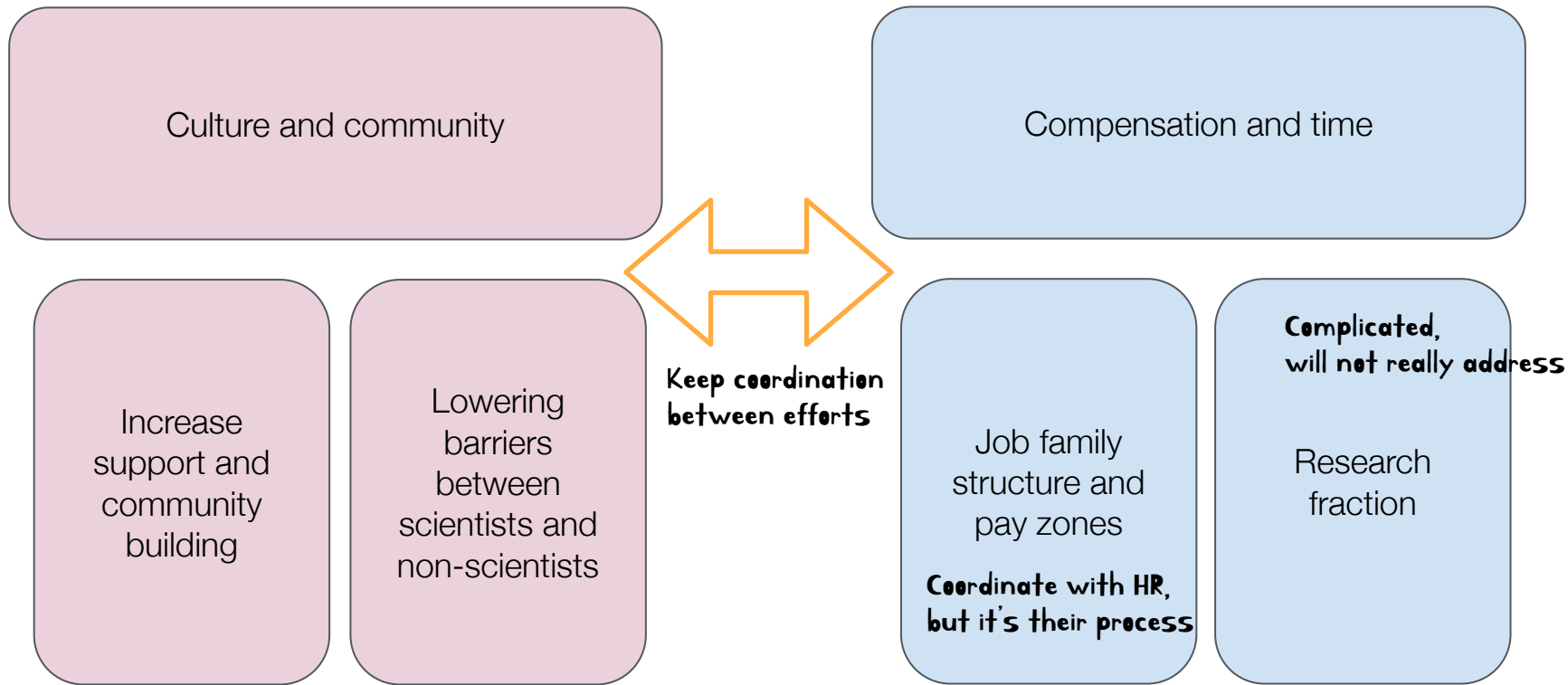
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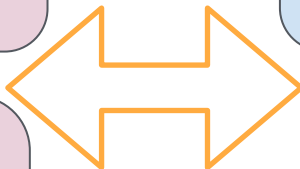
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Culture and community

Compensation and time



Keep coordination
between efforts

Increase support and community building

Lowering barriers between scientists and non-scientists

Job family structure and pay zones
Coordinate with HR, but it's their process

Complicated, will not really address
Research fraction

Initial goal is to find easy-to-implement changes or suggestions for our colleagues

Brainstorming and outlook

LEAD ~~SCIENTIFIC~~ MENTOR

- Increase support and community building
 - Create specific organizational structures for community building and mentorship
 - More credit/recognition when discussing scientific results
- Lowering barriers between Scientists and non-Scientists
 - More scientific in-reach
 - Reduce artificial barriers (W&C list)
- **Your ideas welcome!**
 - **SAC seems (to me) like a good group to help drive an initiative**
- Continue working with HR on job family, coordinate across directorates

Extra



I'll leave you with this take-home: "Diverse perspectives yield the best science" is a true statement, but it's one that commodifies the lived experience of marginalized people by reducing them to their contributions to productivity.

It's a capitalistic framework that shirks the basic truth that cultivating a field where the norm is respecting the humanity and validity of all people is the right thing to do for no reason other than that it is right.

If this is not enough of a justification for you, you are the problem.

#BlackInAstro Experiences: KeShawn Ivory

<https://astrobites.org/2020/06/19/black-in-astro-keshawn-ivory/>