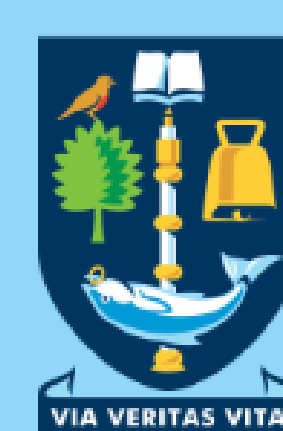


# What does it mean to be a physicist?

## A study of physics identities in an academic environment



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### Introduction

The concept of physics identity, meaning the degree to which one views themselves as a physicist, has garnered interest in recent years as a framework to understand and address the ongoing inequalities in physics participation [1]. However, an individual's definition of what it means to be a physicist will influence how they identify as one, as well as how they engage in the physics community at large. We report on preliminary findings from interviews with staff and PhD students in the School of Physics and Astronomy at the University of Glasgow, which highlight that even within a single institution, there are a variety of definitions of what it means to be a physicist.

### Methodology

- 25 semi-structured interviews with members of staff and PGR student in the School of Physics and Astronomy
- Participants were asked "What does it mean to you to be a physicist?"
- Thematic analysis of transcripts using inductive coding to identify commonalities in perceptions of physicists

### Physics Identity

- How an individual sees themselves as a physicist, or a 'physics person'
- Factors that affect physics identity include [2]:
  - Interest in physics
  - Performance / Competence in physics skills
  - Recognition by others as a physicist
  - Sense of belonging to physics community

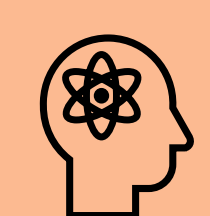
### Results

*"Can you explain concepts to people so that they understand it? That makes a good physicist."*

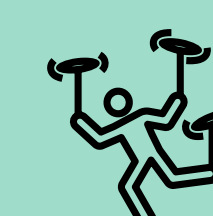
References: 8

#### Communication

Working with fellow physicists, sharing research, teaching students, explaining to others



**What makes a Physicist?**



*"So, what makes a physicist? I think it's a certain way of thinking, it's a natural curiosity."*

References: 9

#### Mindset

'Thinking like a physicist', approaching problems with curiosity, focused on 'why?'

References: 11

#### Qualification

Having a degree and / or doctorate in physics, or a closely-related subject

*"To be a physicist, you have to be, you have to have gone through training to get the fundamentals"*

#### Practice

Using physics day-to-day, applying physics knowledge to problems

*"[I'm] having to solve these problems and using physics every day as a tool at my work"*

References: 19

### Conclusion

- The definition of the term 'physicist' is multifaceted, even within a single population of physicists working at an institution
- When studying physics identity, care must be taken to recognise what ideas an individual has about what it means to be a physicist, and how these relate to their self-perceptions as a physicist
- These results build on previous work by Irving and Sayre on student perceptions of what it means to be a physicist [3], extending their framework to include communication of physics as a key factor in feeling like a physicist
- Physics students should receive opportunities throughout their studies to engage in each of these areas in order to develop stronger physics identities – particularly within the realm of practice

#### References

- [1] Hazari, Zahra, Gerhard Sonnert, Philip M. Sadler, and Marie-Claire Shanahan. 2010. 'Connecting High School Physics Experiences, Outcome Expectations, Physics Identity, and Physics Career Choice: A Gender Study'. *Journal of Research in Science Teaching* 47(8):978–1003. doi: 10.1002/tea.20363.
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- [3] Irving P W and Sayre E C 2015 Becoming a physicist: The roles of research, mindsets, and milestones in upper-division student perceptions *Phys. Rev. Spec. Top. - Phys. Educ. Res.* 11 020120