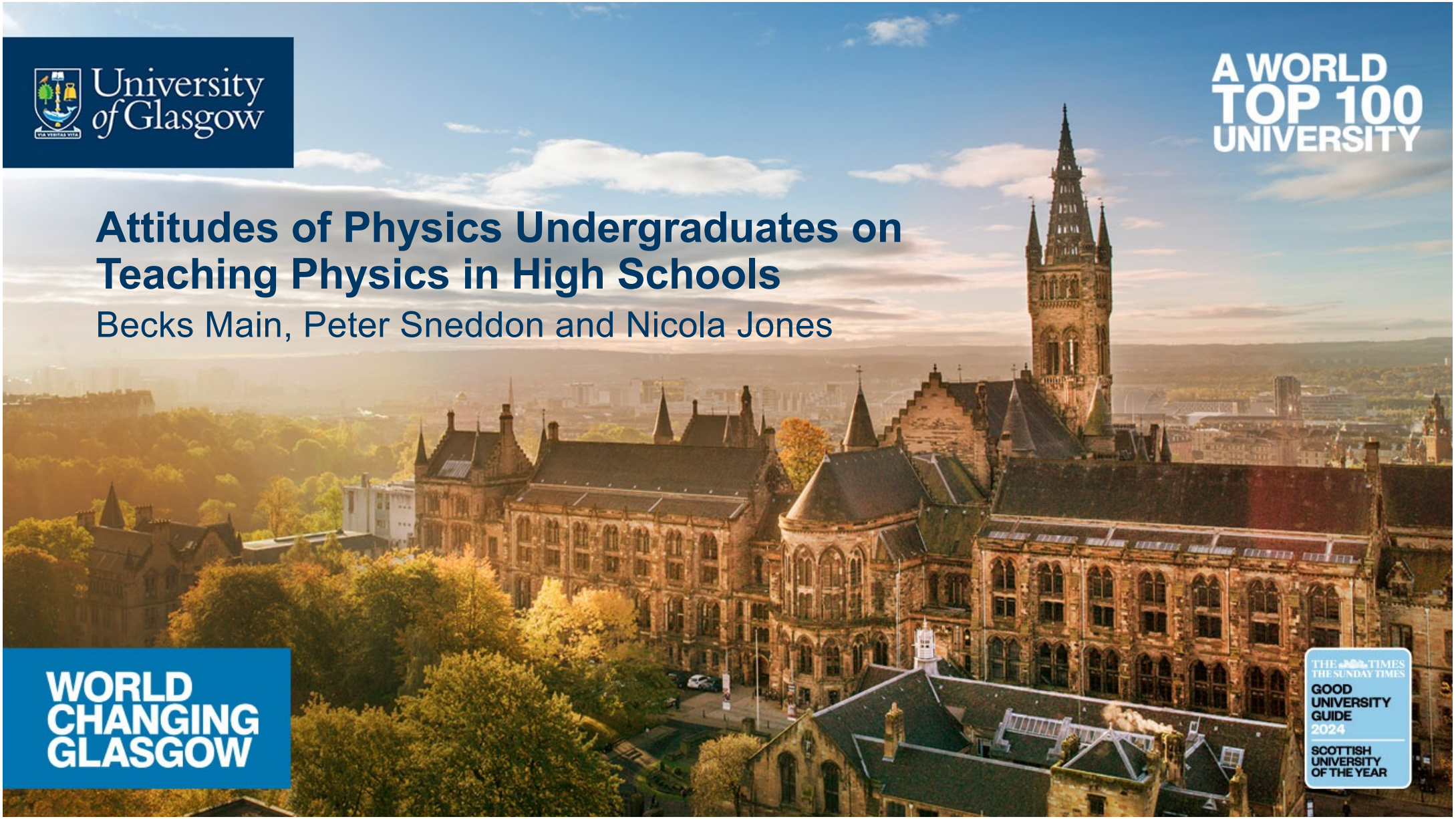
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A WORLD TOP 100 UNIVERSITY
Attitudes of Physics Undergraduates on Teaching Physics in High Schools
Becks Main, Peter Sneddon and Nicola Jones
WORLD CHANGING GLASGOW
THE TIMES THE SUNDAY TIMES
GOOD UNIVERSITY GUIDE 2024
SCOTTISH UNIVERSITY OF THE YEAR

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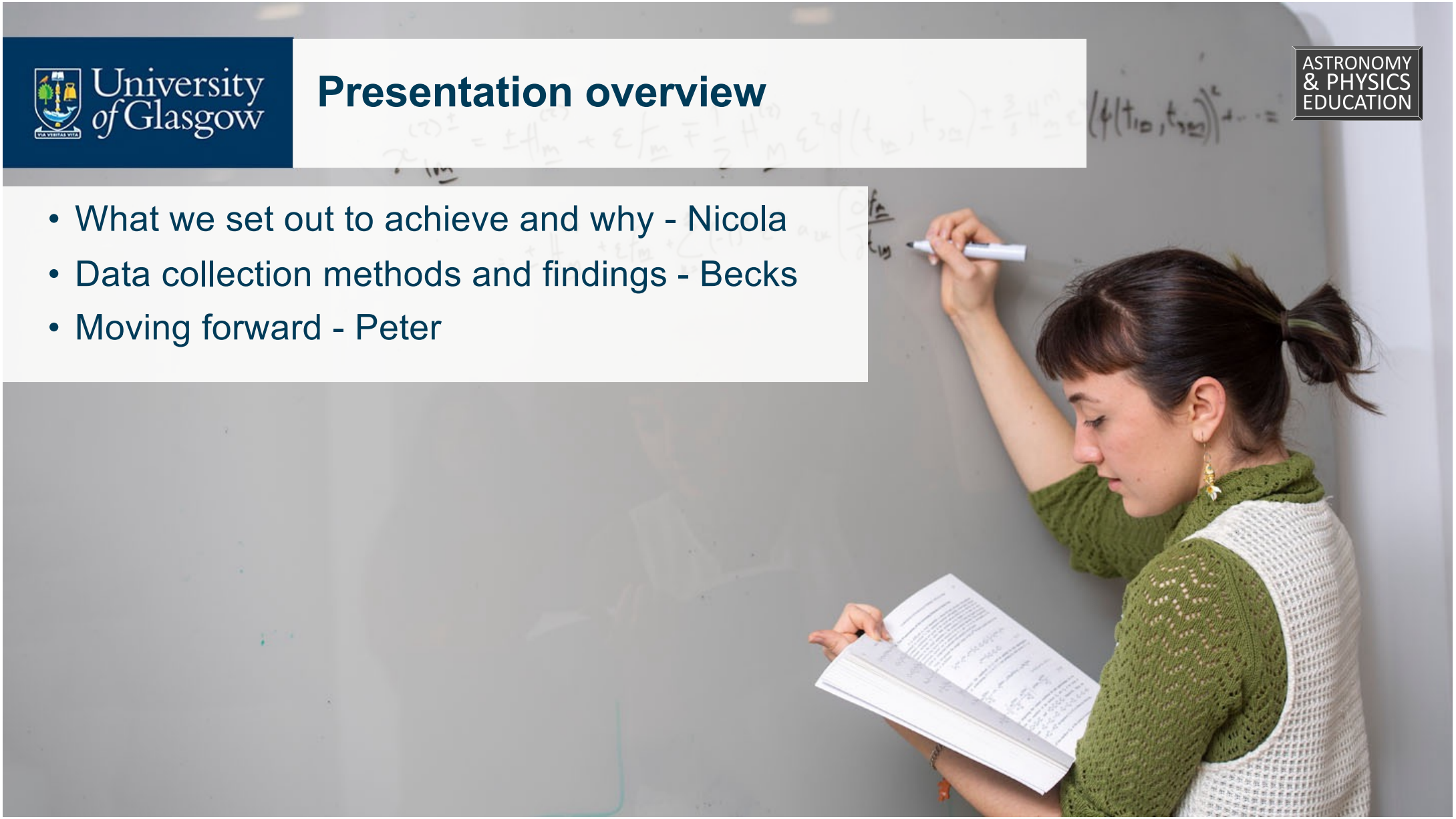
Presentation overview

ASTRONOMY & PHYSICS EDUCATION

- What we set out to achieve and why - Nicola
- Data collection methods and findings - Becks
- Moving forward - Peter



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What did we set out to understand?

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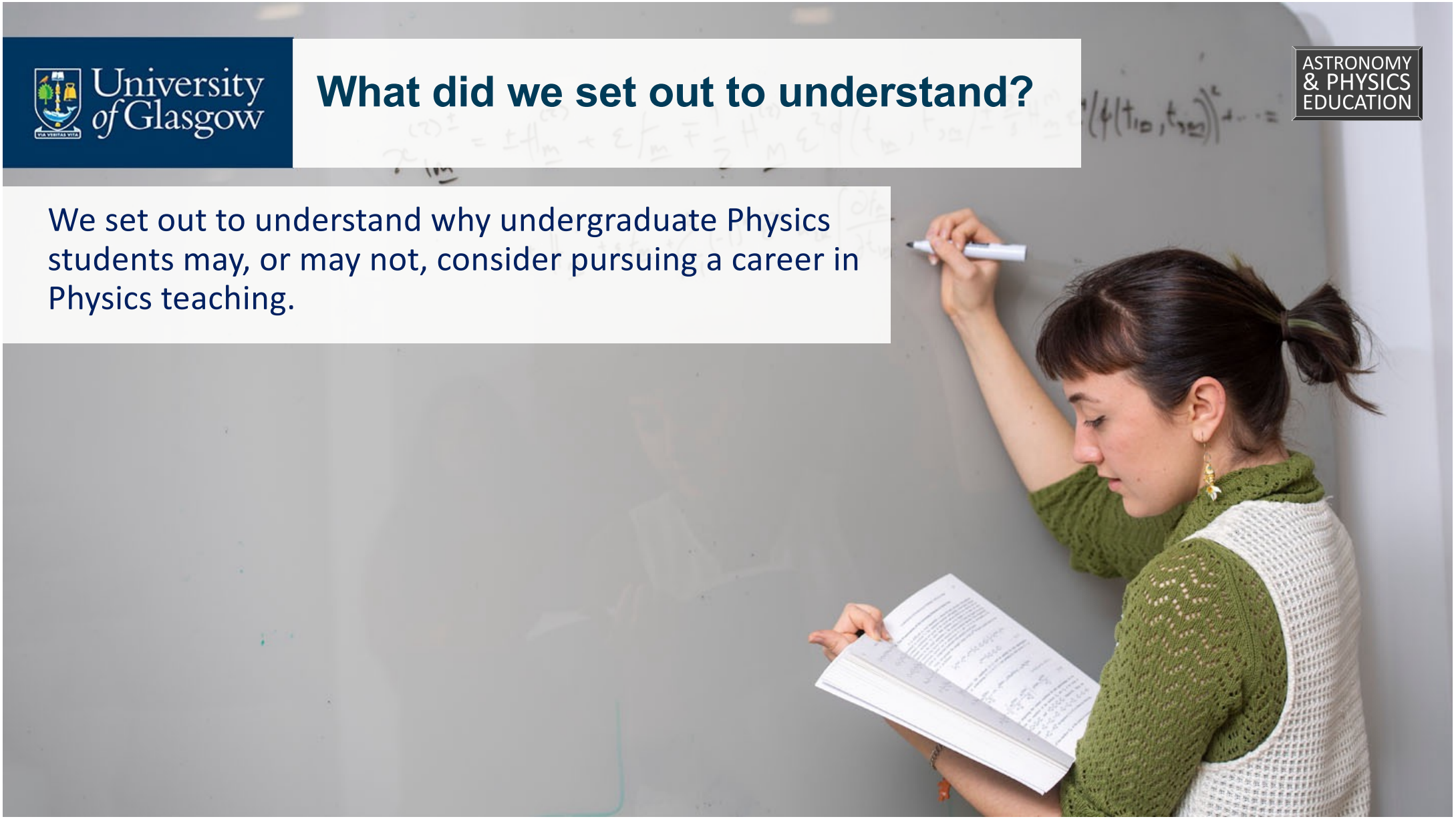
We set out to understand why undergraduate Physics students may, or may not, consider pursuing a career in Physics teaching.



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Why is that understanding important?

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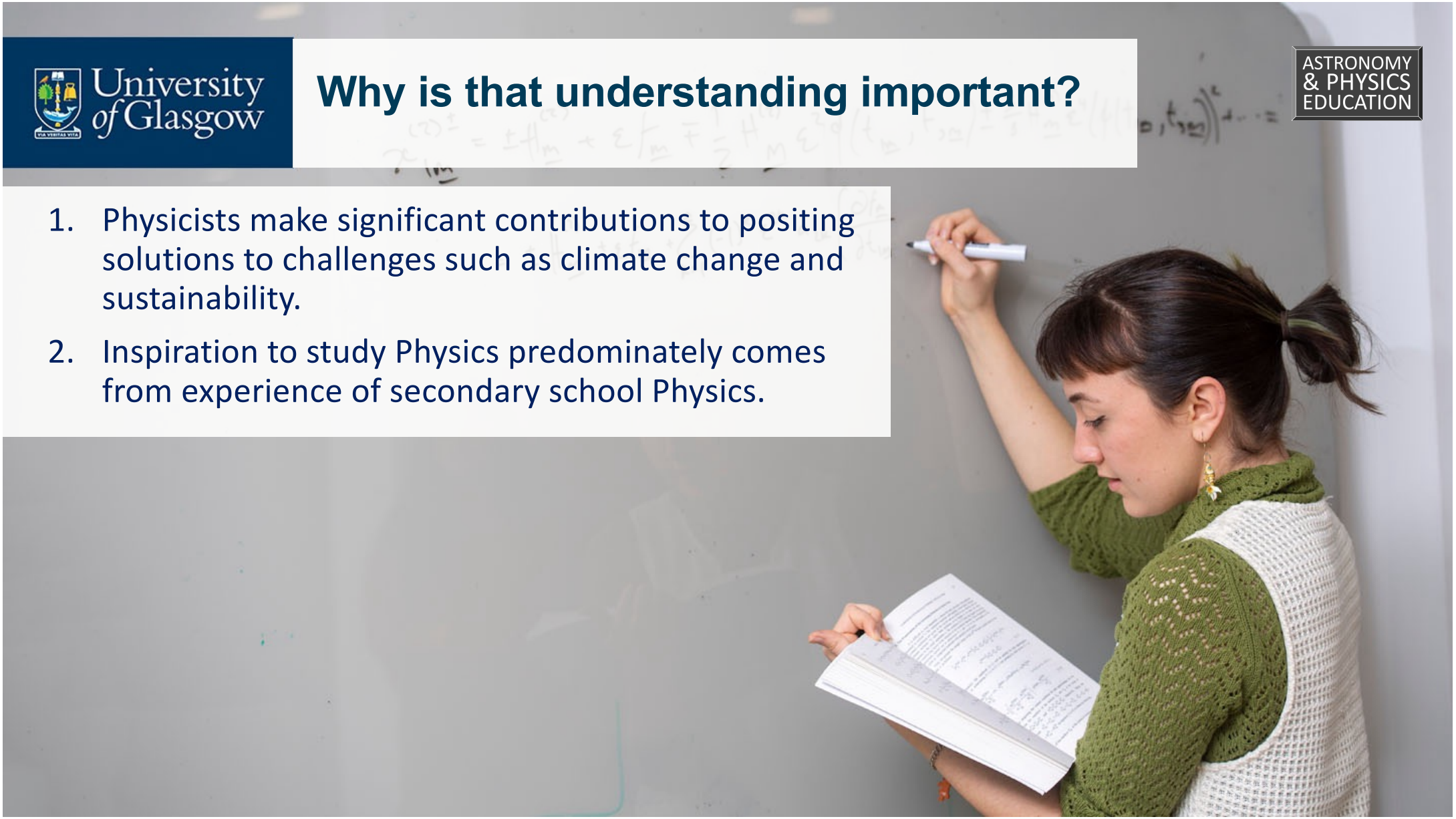
1. Physicists make significant contributions to positing solutions to challenges such as climate change and sustainability.
2. Inspiration to study Physics predominately comes from experience of secondary school Physics.



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Why is that understanding important?

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3. Consistent under recruitment into Physics teacher education courses across Scotland.

Date	Scottish Government target	University reported statistics	Percentage of target reached
October 2023	131	38	**29%**
October 2022	131	60	**46%**
October 2021	117	59	**50%**
October 2020	120	84	**70%**
October 2019	122	76	**62%**
October 2018	81	60	**74%**

Teacher workforce planning group] Scottish Government, from www.gov.scot/groups/teacher-workforce-planning-advisory-group/

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Why is that understanding important?

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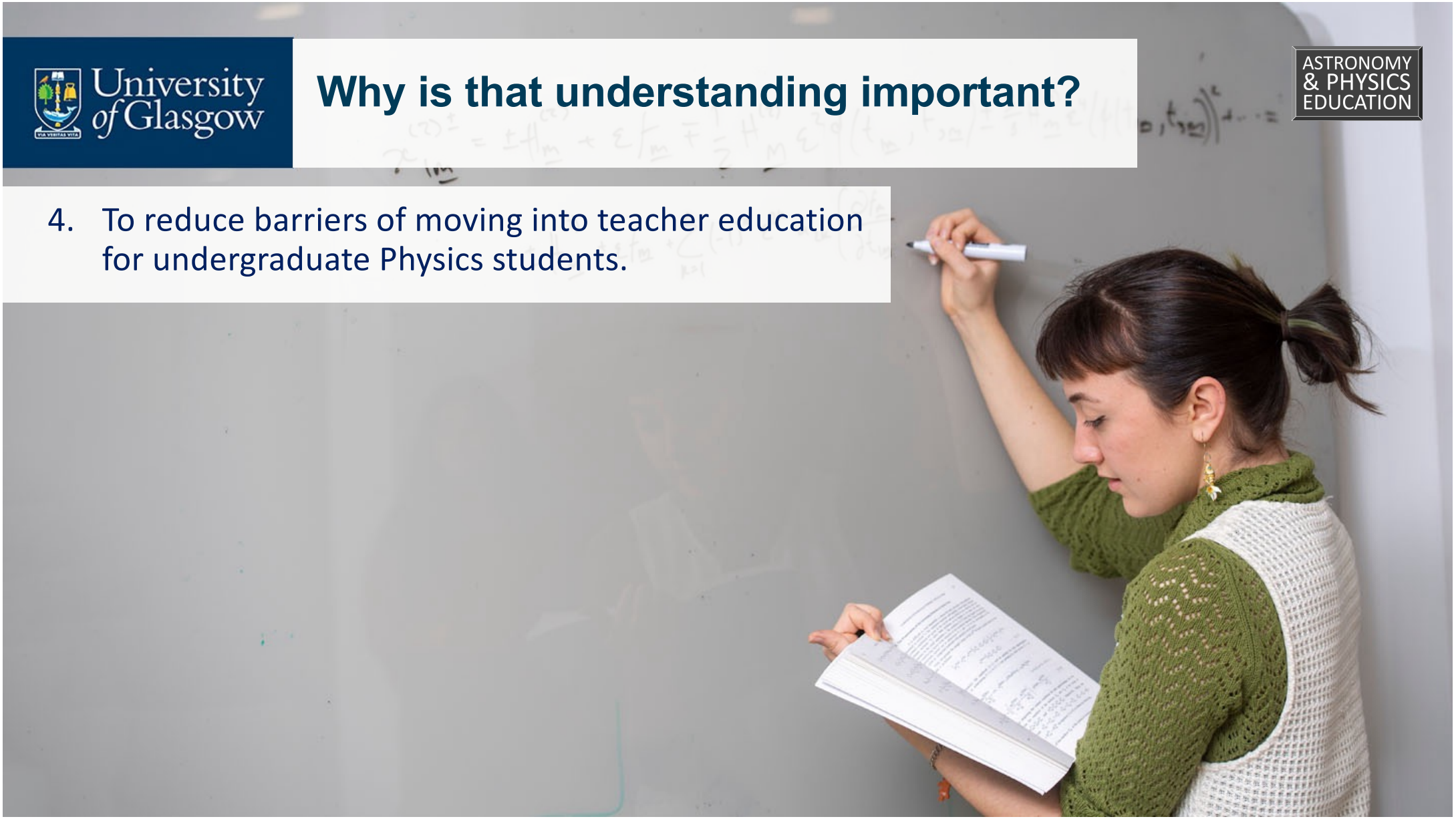
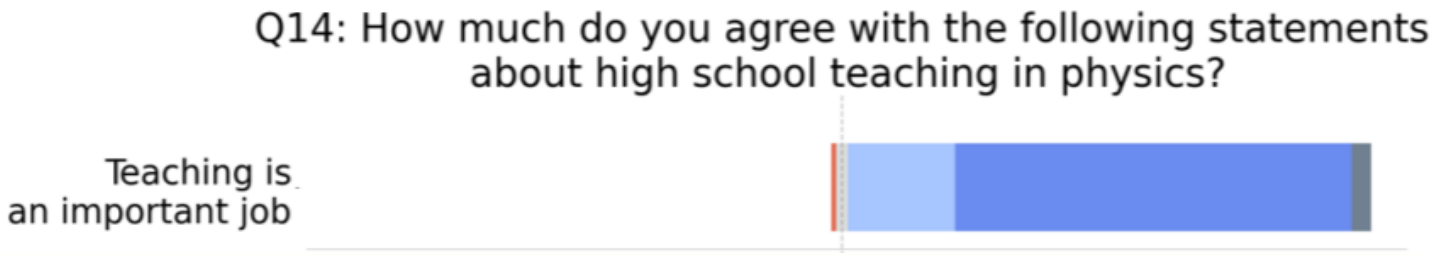
4. To reduce barriers of moving into teacher education for undergraduate Physics students.



Setting the Scene



93% agree or strongly agree that teaching is an important job.

Of these students, **32%** considered teaching but **decided against it** as a career, and **42% hadn't considered it at all**.

What are the reasons?

Step 1 - data collection:

- Survey (N=325)
- Focus groups (N=16)

Method: Survey

- Main question: **what do physics undergrads think of teaching as a profession, and what are the reasons why?**
- Microsoft Forms survey to preserve anonymity through using university emails.
- 18 questions, including multiple choice, 5-point Likert scale and long response questions.

Multiple choice questions covered:

- Gender, year group, degree subject.
- Whether or not respondents wanted to pursue teaching after their degree.
- Whether respondents went to state or private school, and what their view of their own teachers are.
- If respondents had a family member who teaches.

Method: Survey

Likert scale questions:

- Intrapersonal views
- General views on teaching
- Importance of factors when considering career choices.
- Whether the same factors were fulfilled when considering a teaching career.

Long response questions:

- Comments about becoming a physics teacher
- Respondent's high school experience with teachers
- What barriers do respondents perceive when pursuing a career in teaching.
- Any further comments on teaching physics in high school.

Survey Results: Quantitative Data

Response no. was N = 325.

Respondent demographics:

- 60% male, 36% female, 4% other/prefer not to say
- 55% with no teacher relative, 44% with a teacher relative.
- **9 people total over all years** had plans to become a teacher.

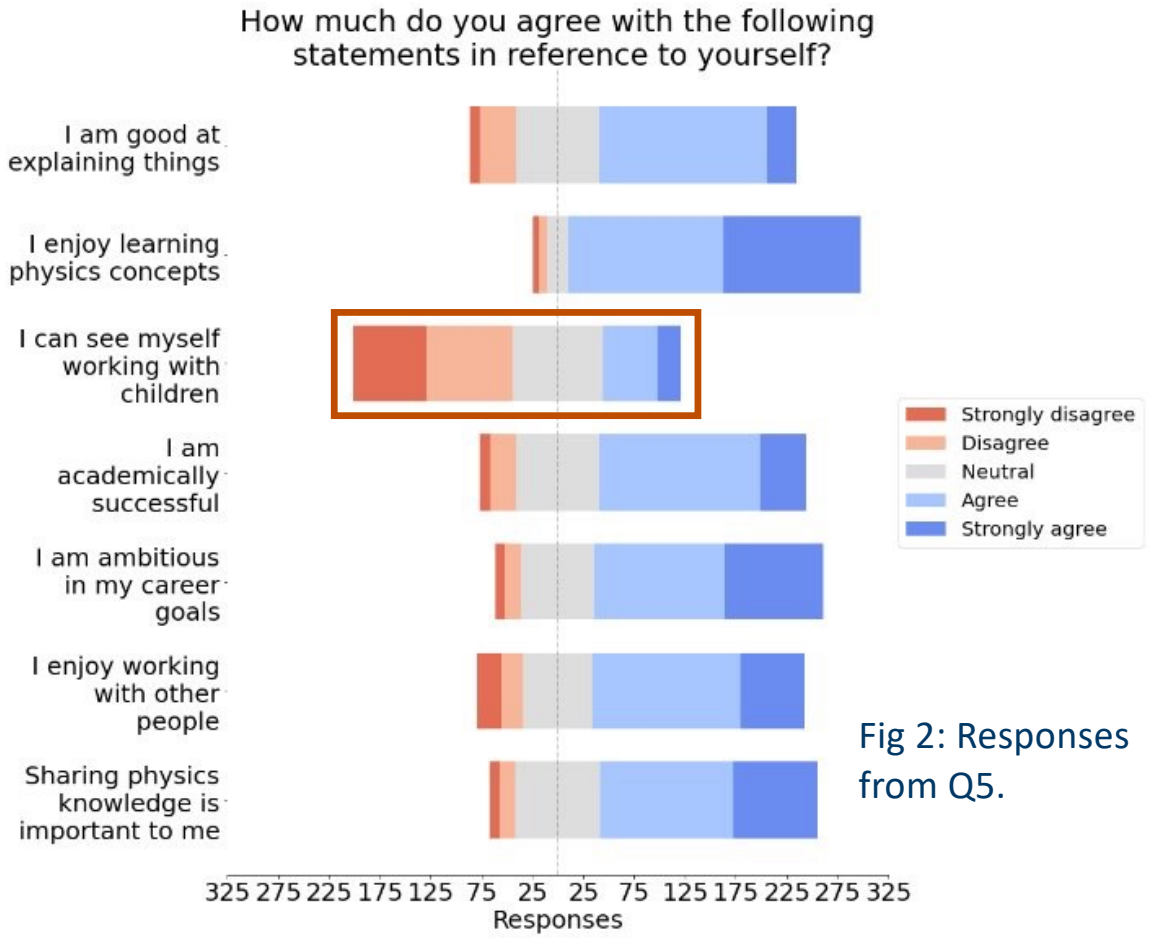


Fig 2: Responses from Q5.

Survey Results: Quantitative Data

Have you ever considered becoming a physics teacher after completing university?

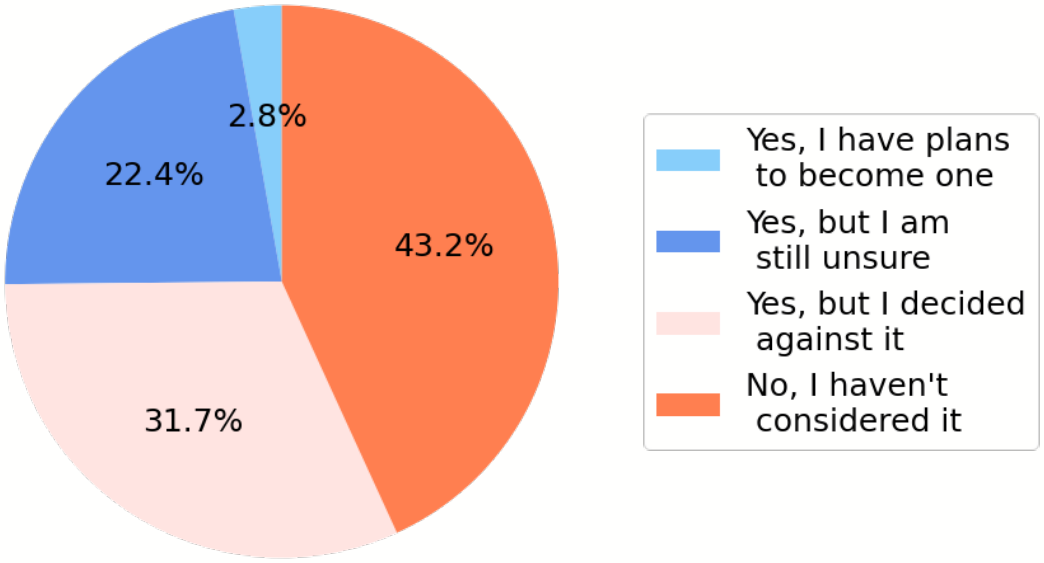


Fig.3: Teaching decision pie charts, showing most respondents have not even considered teaching as a career option.

Survey Results: Qualitative Data

Exemplary long responses:

- *"Two main reasons for deciding against is the poor salary and the large amount of students who do not want to be there. Whilst a good teacher can change this, I don't think I would be good enough."*
- *"Dealing with difficult pupils, particularly in younger years, seems very unappealing. Teaching only advanced Higher pupils would be good."*
- *"I feel like my physics degree could provide opportunities with better pay, better hours, and better work environment."*
- *"Very little experience with tutoring or teaching until later years in university."*

Method: Focus Groups

- Option to opt in to focus groups included at the end of the survey.
- Gave an opportunity to fill in any gaps in the survey and get more in-depth answers for certain trends found during analysis.
- Discussion steered through interactive questions on Mentimeter: allowed for some responses to be recorded to back up discussion notes.
- Groups were organised into year groups, with 1st, 2nd and 3rd years grouped together due to low respondent numbers.

Focus Group Results

- N=16. Unfortunately, only 3rd years attended the lower years group, so 1st and 2nd year views are missing.

- **Main issues**: pay, workload and commanding a classroom/working with children.
- 3rd years felt there **wasn't *any* teaching experience** in their degree so far.
- 4th and 5th years felt that optional teaching courses are unprioritized and there is no suitable course focusing on **science communication techniques**.

- All groups were mostly unknowledgeable about funding opportunities for PGDE and other teaching qualifications.

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Focus Group Results

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Ranking	3rd years	4th years	5th years
1st	Not excited by the career path	Working with teenagers	Working with teenagers
2nd	Working with teenagers	Not excited by the career path	Have heard it's a bad career choice
3rd	Perception from peers/ family/public	Have heard it's a bad career choice	Not excited by the career path
4th	Lack of experience in a teaching role	Lack of experience in a teaching role	Lack of experience in a teaching role
5th	Have heard it's a bad career choice	Don't know enough about it	Perception from peers/ family/public
6th	Don't know enough about it	Perception from peers/ family/public	Don't know enough about it

Table 1: Reasons for people being put off a teaching career ranked by different year groups during focus groups.

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Conclusions

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Large percentage of students hadn't considered or had already decided against teaching as a career.

Four main reasons undergrad students dismissed a teaching career:

- Views on pay and workload.
- Working with children.
- Teaching viewed as a worse choice than other graduate options for various reasons.
- Lack of teaching experience within their degree.

Focus groups raised a noticeable **lack of advertisement** of teaching as a genuine career option for physics graduates.

Presentation skills and science communication also perceived as unprioritised in undergraduate physics degrees.

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Moving forward in response to findings

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Most respondents hadn't considered teaching as a career – possible ways to address this include:

- Teaching-focussed Information at careers events,
- Visits to senior undergraduate lecture courses by current PGDE students to give a clear picture of what the career looks like
  - Addressing (e.g.) concerns such as behaviour management

- **Realistic job previews** (RJPs) have been shown to be helpful in introducing teaching careers to undergraduate students.

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Moving forward in response to findings

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Opportunities to work with children/young people:

- We run a course that allows undergraduate students to gain academic credit for this Physics degree by working in local secondary schools – “Physics education and communication”
- Encourage senior undergraduates to take part in Outreach events held both at University and, ideally, in Schools

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Moving forward in response to findings

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Provide additional opportunities for students to experience teaching:

- We have a Peer Tutoring course that allows students to gain credit helping junior students
- We are introducing undergraduate demonstrator positions to let senior students teach in the first-year undergrad labs

- Signposting in degree of opportunities to develop teaching skills and peer teach.

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Next steps in the research

- The work discussed here is continuing this year to look for trends that extend beyond specific cohorts and – hopefully – see an improvement in perceptions as interventions are introduced

- Carry out a parallel study with students in the James Watt School of Engineering who are also a pool for Physics ITE.
  - Does the degree background affect expectations and views?


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Thank you :)
Happy to take questions now, or if you wish to explore any of these issues further please contact
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