Introduction to Focus Groups

International Teacher Weeks Programme 2019
How and when?
How and when?

09:00 → 10:30 Lectures
- Elementary Particle Physics in Early Physics Education
  Speaker: Jeff Werner (CERN)

11:00 → 12:30 Workshops
- A Hands-on Tour Through Particle Physics on a Small Budget
  Speaker: Julia Wörhe (CERN), Alexandra Jansky (University of Vienna (AT)), Ingrid Karam Nilsen, Oliver Michael Keller (University of Groningen (NL)), Fabian Bemotte (CERN, Johann Wolfgang Goethe-Universität (DE)), Matthew Graham, Arjo Knefel Hornat (University of Potsdam (DE))

12:30 → 13:30 Lunch Break

13:30 → 17:45 Lectures
- Introduction to Focus Groups
  Speaker: Jeff Werner (CERN)
- Errors and Uncertainty in Particle Physics
  Speaker: Andrea David (CERN)
- Coffee Break

16:00 → 17:45 Social Event
- First Questions & First Answers
  Speaker: Kristof Schmiedel (CERN)
- Bowling & Pizza
  A taxi will pick up the whole group in front of the CERN hotel (Building 39) at 17:45
  bowling4ind.ch
How and when?

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>9:00</td>
<td>Lectures</td>
<td>Elementary Particle Physics in Early Physics Education</td>
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<tr>
<td></td>
<td></td>
<td>45/S2-C01 - Sala Corfu</td>
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<tr>
<td>11:00</td>
<td>Workshops</td>
<td>A Hands-on Tour Through Particle Physics on a Small Budget</td>
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<td>143/R-003 - S/Cool LAB</td>
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<tr>
<td>12:30</td>
<td>Lunch Break</td>
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<tr>
<td>13:30</td>
<td>Lectures</td>
<td>Introduction to Luminosity</td>
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<td>523/T-001 - Council Chamber</td>
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<tr>
<td>15:30</td>
<td>Coffee Break</td>
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<tr>
<td>16:00</td>
<td>First Questions &amp; First Answers</td>
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<tr>
<td>17:45</td>
<td>Social Event</td>
<td>Bowling &amp; Pizza</td>
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A bus will pick up the whole group in front of the CERN house (Building 39) at 17:45.
bowling39.ch
# How and when?

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:00</td>
<td>Lectures</td>
<td>SU 130 Piz Gloria</td>
<td>1h 10m</td>
</tr>
<tr>
<td>11:00</td>
<td>Workshops</td>
<td>SU 140 Piz Gloria</td>
<td>1h 10m</td>
</tr>
<tr>
<td>12:30</td>
<td>Lunch Break</td>
<td>SU 140 Piz Gloria</td>
<td>1h</td>
</tr>
<tr>
<td>13:30</td>
<td>Lectures</td>
<td>SU 140 Piz Gloria</td>
<td>1h 10m</td>
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<tr>
<td>15:30</td>
<td>Coffee Break</td>
<td>SU 140 Piz Gloria</td>
<td>30m</td>
</tr>
<tr>
<td>17:45</td>
<td>Social Activities</td>
<td>SU 140 Piz Gloria</td>
<td>4h 15m</td>
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</tbody>
</table>

**Elementary Particle Physics in Early Physics Education**
Speaker: Jeff Weiner (CERN)

**A Hands-on Tour Through Particle Physics on a Small Budget**
Speakers: Jörg Möller (CERN), Alexander Jerszy (University of Vienna), Ingrid Karmo Nilsson, Oliver Michael Keller (Universität des Saarlandes), Fabian Bezmocle (CERN), Johann Wolfgang Goethe University (D), Matthew Graham, Arj Karcic Horvat (University of Patras, CH)

**Introduction to Focus Groups**
Speaker: Jeff Weiner (CERN)

**First Questions & First Answers**
Speaker: Heintz Schmid (CERN)

**Bowling & Pizza**
A bus will pick up the whole group in front of the CERN Hotel (Building 39) at 17.45
bowling@cern.ch
How and when?
How and when?

WEEK 1

FG Session 1
Wednesday, 7 August
15:30-17:00

FG Session 2
Thursday, 8 August
16:30-17:30

WEEK 2

FG Session 3
Monday, 12 August
16:00-17:30

FG Session 4
Thursday, 15 August
14:00-17:00

Last day of ITW2019

FG Final Reports
Friday, 16 August
9:00-12:30

Guiding research questions about the FG topics

A) To what extent is the topic featured in your curriculum?
B) Which students’ conceptions about the topic do you know?
C) What is your experience with teaching the topic in your classroom?
D) Which words and phrases can cause difficulties and misunderstandings?
E) Which aspects of the topic do you consider challenging to teach to students?
F) Which aspects of the topic do you think can be appropriately introduced in the classroom?

Guidelines for the final report

1) Curriculum & classroom connections (Presentation)
Highlight potential connections to the various curriculums and your individual teaching practices

2) Key ideas (Presentation & Paper)
Showcase the most important aspects of the topic that you consider to be key for meaningful instruction

3) Potential students’ conceptions & challenges (Presentation)
Illustrate elements of the topic that might obstruct a successful introduction in the classroom

4) Helpful material and resources (Presentation)
Reference any material that you find useful for your students and/or your colleagues

5) Best practice example (Presentation & Paper)
Summarise your findings through a brief outline of an instructional strategy
Which topics?
Which topics?

1. Particle Physics & Errors and Uncertainty
2. Particle Accelerators
3. Particle Detectors
4. Data Analysis in Particle Physics
5. Computing in Particle Physics
6. Medical Applications of Particle Physics
7. Higgs Physics
8. Antimatter Research
9. Future Accelerators
Process
Process

Guiding research questions about the FG topics
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F) Which aspects of the topic do you think can be appropriately introduced in the classroom?
Aims and goals?
Aims and goals?

Be creative
Aims and goals?

Be creative
Collaborate
Aims and goals?

Be creative
Collaborate
Share your experiences
Aims and goals?

Be creative
Collaborate
Share your experiences
Learn from your colleagues
Aims and goals?

Be creative
Collaborate
Share your experiences
Learn from your colleagues
Create and develop something
Aims and goals?

Be creative
Collaborate
Share your experiences
Learn from your colleagues
Create and develop something

Independently & self-organised!
Aims and goals?

Be creative  
Collaborate  
Share your experiences  
Learn from your colleagues  
Create and develop something

Present the results and outcomes of your focus group through a detailed and extensive final report

Independently & self-organised!
Aims and goals?

Be creative
Collaborate
Share your experiences
Learn from your colleagues
Create and develop something

Present the results and outcomes of your focus group through a detailed and extensive final report

Independently & self-organised! 5x2mins + 5mins
Aims and goals?

Be creative
Collaborate
Share your experiences
Learn from your colleagues
Create and develop something

Present the results and outcomes of your focus group through a detailed and extensive final report
Share the results with your students and your colleagues

Independently & self-organised! 5x2mins + 5mins
Aims and goals?

<table>
<thead>
<tr>
<th>Be creative</th>
<th>Collaborate</th>
<th>Present the results and outcomes of your focus group through a detailed and extensive final report</th>
<th>Share the results with your students and your colleagues</th>
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<tbody>
<tr>
<td>Share your experiences</td>
<td>Learn from your colleagues</td>
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<tr>
<td>Create and develop <strong>something</strong></td>
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Independently & self-organised! 5x2mins + 5mins  Send us feedback!
FG assignment
FG assignment

Guiding research questions about the FG topics
A) To what extent is the topic featured in your curriculum?
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Summarise your findings through a brief outline of an instructional strategy

1 Particle Physics & Errors and Uncertainty
2 Particle Accelerators
3 Particle Detectors
4 Data Analysis in Particle Physics
5 Computing in Particle Physics
6 Medical Applications of Particle Physics
7 Higgs Physics
8 Antimatter Research
9 Future Accelerators
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<tr>
<td>09:00</td>
<td>Focus Groups - Final Reports</td>
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<tr>
<td>09:30</td>
<td>Introduction &amp; Overview</td>
<td>15m</td>
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<tr>
<td>09:45</td>
<td>Focus Group // Particle Physics &amp; Errors and Uncertainty</td>
<td>15m</td>
</tr>
<tr>
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Output
Output

Guidelines for the final report
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5) Best practice example (Presentation & Paper)
Summarise your findings through a brief outline of an instructional strategy
Focus group title (Arial 14pt, bold, left aligned)

(leave one 14 pt blank line here)

Author 1, Author 2, Author 3, Author 4, Author 5, Author 6 (Arial 10pt, left aligned)

1 Name of School, City, Country | author.one@email.com
2 Name of School, City, Country | author.two@email.com
3 Name of School, City, Country | author.three@email.com
4 Name of School, City, Country | author.four@email.com
5 Name of School, City, Country | author.five@email.com
6 Name of School, City, Country | author.six@email.com

(leave four 8pt blank lines here)

Key ideas (Arial 10pt, bold, left aligned)

(leave one 10pt blank line here)

Showcase the most important aspects of the topic that you consider to be key for a meaningful instruction in the classroom. (Arial 10pt, left aligned)

(leave two 10pt blank lines here)

Best practice example (Arial 10pt, bold, left aligned)

(leave one 10pt blank line here)

Summarise your findings through a brief outline of an instructional strategy. Explain how to best introduce the topic in your classroom. (Arial 10pt, left aligned)

(leave two 10pt blank lines here)
Questions?

jeff.wiener@cern.ch