Outreaching Particle Physics to Developing Countries

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Developing countries account for 80% of the world's population but only 28% of the world's scientists come from these countries.

We don't know where the next Curie or Einstein will originate from.
Sustainable Development

• the need to solve environmental and developmental problems requires scientists

• investment into educational, technological and cultural institutions play a key role in growing a knowledge-based economy

• scientific research at universities drives quality of education at all levels
Advance of the knowledge based society

- Fundamental Science
- Applied Science
- Technology, Engineering and Innovation
- Sustainable Development
Gaza
Islamic University of Gaza
AlAzhar University
Muhammed Alhissi – Gaza

“My dream is to obtain a PhD in Physics and do research”

“Thanks to ICTP, I applied for a joint master scholarship, and I got it. I am glad for this but not glad enough since I do not know how I will travel to Italy from this big prison "Gaza"!”

“Even when the crossing opens, there are more than 10,000 people in front of me waiting to travel. “

“Sometimes, I feel that my dream will vanish. Many students lost their opportunities to study abroad”
Issues for students

Interest in Research:
- Students do not see a degree in physics leading to anything other than a teaching career
- Students often have little or no exposure to research
- Badly equipped laboratories demotivate students

Awareness of opportunities:
- Students often are not aware of opportunities to study abroad, or possible career paths

Brain drain:
- Students who do continue their studies abroad often do not see opportunity back in their home country and do not return
Issues for Academics

**Isolation:**
- Lack collaborators, funding for conferences, visits

**Universities are often seen only as teaching institutions**
- Little opportunity for funding for research
- Faculty saturated with teaching

**Brain drain:**
- Physicists will often leave their home country
Physics Without Frontiers

- Stimulate interest in Research
- Raise awareness of opportunities
- Fight the brain drain
- Promote physics research
Physics Without Frontiers

Palestine
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>09.00</td>
<td>Welcome &amp; introduction</td>
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<tr>
<td>09:15</td>
<td>Lecture I: <strong>Standard Model of Particle Physics</strong>&lt;br&gt;Ahmad Zein Assi (ICTP)</td>
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<tr>
<td>10:00</td>
<td>Lecture II: <strong>Discovering Physics with Hadron Colliders</strong>&lt;br&gt;Kate Shaw (ICTP)</td>
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<td>10:45</td>
<td>Break</td>
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<td>11:15</td>
<td>Lecture III: <strong>Detecting Particle with ATLAS</strong>&lt;br&gt;Remi Zaidan (University of Iowa)</td>
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<td>12.00</td>
<td>Lunch</td>
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<td>13.00</td>
<td>Lecture V: <strong>Introduction to the Hands on Session</strong>&lt;br&gt;Kate Shaw (ICTP)</td>
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<tr>
<td>14.00</td>
<td><strong>Hands on Session using LHC Data</strong></td>
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<td>15.30</td>
<td>Combination and Analysis</td>
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<tr>
<td>15:45</td>
<td>Virtual Visit with ATLAS Control Room</td>
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<tr>
<td>16.30</td>
<td>Lecture VI: <strong>Careers and Opportunities</strong>&lt;br&gt;Ahmad Zein Assi (ICTP)</td>
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<tr>
<td>17.00</td>
<td>Certificates and Goodbye</td>
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Role Models
What can you do?
Virtual Visit to ATLAS Control room
Public Lectures
Networking
Partner with a University

Birzeit University, Palestine

Taught masters course Particle Physics as visiting lecturer with Bobby Acharya remotely
Partner with a University

- Lecture series
  - Virtual or Real!
- Exchange students
- Postdocs visit
- Apply for funding for sandwich programs
- Keep ties, send information on opportunities
- Attend their conferences
- Collaborate
Outreach, Outreach, Outreach

• Scientific community needs the best students to choose Physics at University – whatever their background
Outreach, Outreach, Outreach, Outreach
Our native countries: are we untapping our potential?

Three major demographic factors correlated with the likelihood of a young person choosing physics at A-level.

- Gender
- Socioeconomic status
- Ethnic background

We must learn the barriers preventing young people from different backgrounds choosing STEM, in particular physics has the largest gap.
Pool of well educated and motivated men and women from developing countries who need opportunities for study and collaboration

- Scientific opportunity must be based on merit, not on one's country of birth or economic background

- There is a huge untapped potential of scientists throughout the world, we and our institutes must reach out and collaborate
Thank you!

What if the next Curie or Einstein is a student in a country where scientific research and education is not a priority?