

CMS International Masterclasses in Mexico

International Conference on High Energy Physics 2022

Alfredo Aranda, Universidad de Colima, fefo.aranda@gmail.com

Cecilia Uribe Estrada, Benemérita Universidad Autónoma de Puebla,
cecilia.uribe.estrada@cern.ch

K. Cecire, University of Notre Dame, kcecire@nd.edu

Fabiola Vazquez, Universidad Iberoamericana, fabiola.vazquez@prepaibero.mx



In Memoriam: Salvador Carrillo

We are grateful for all he did to advance International Masterclasses in Mexico and around the world.



Salvador Carrillo
Universidad
Iberoamericana, Mexico

Introduction



What is a masterclass?

“Particle physicist for a day”

- Intro
- Tour
- Analyze authentic HEP data.
- Videoconference



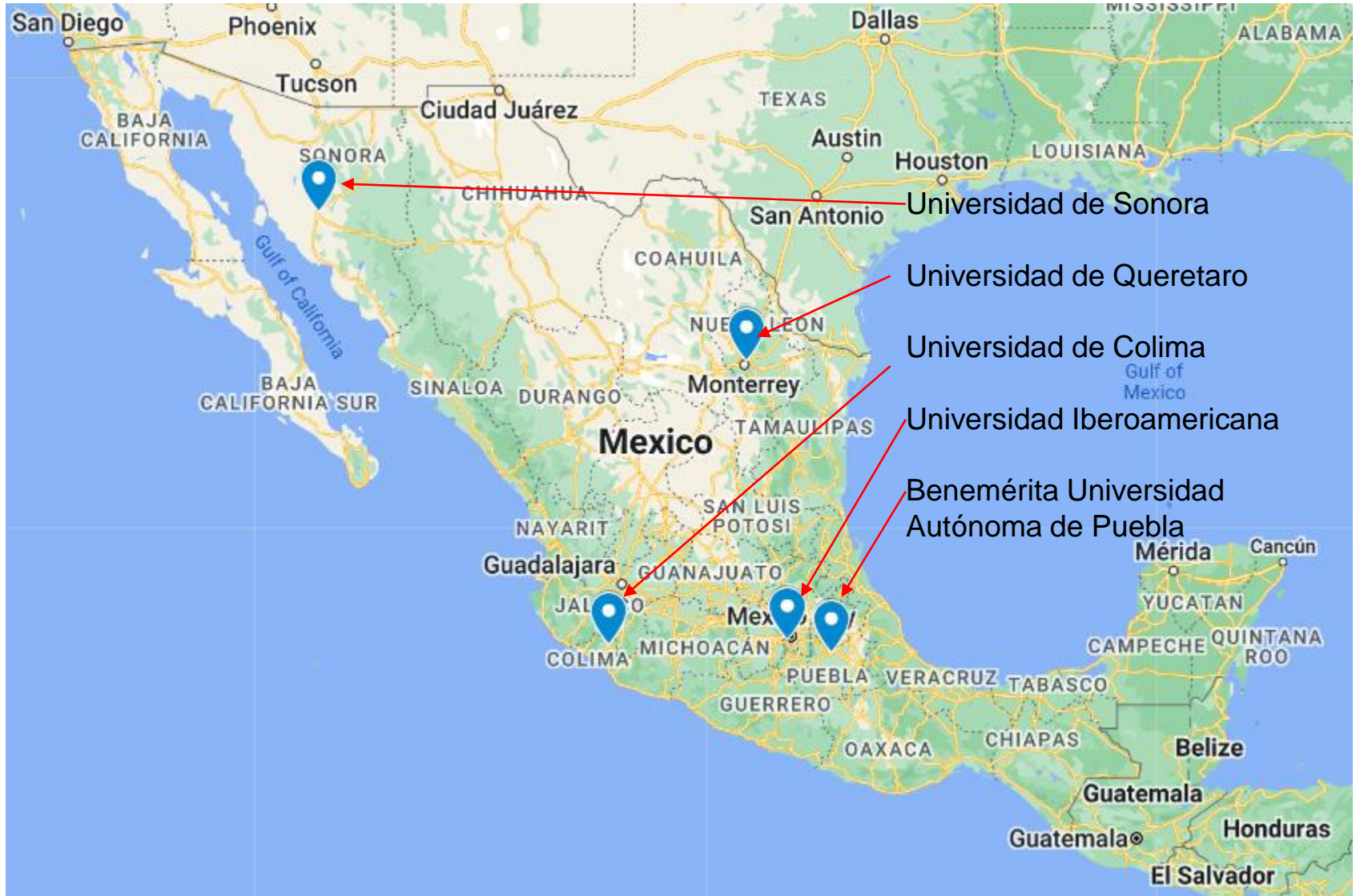
International Masterclasses

- > 50 Countries
- > 10⁴ Students
- 5 institutes in Mexico
- All connect to Fermilab Videocon
- Numbers were down in 2020-22



After the pandemic, IMC is on the rebound.

Masterclass Institutes



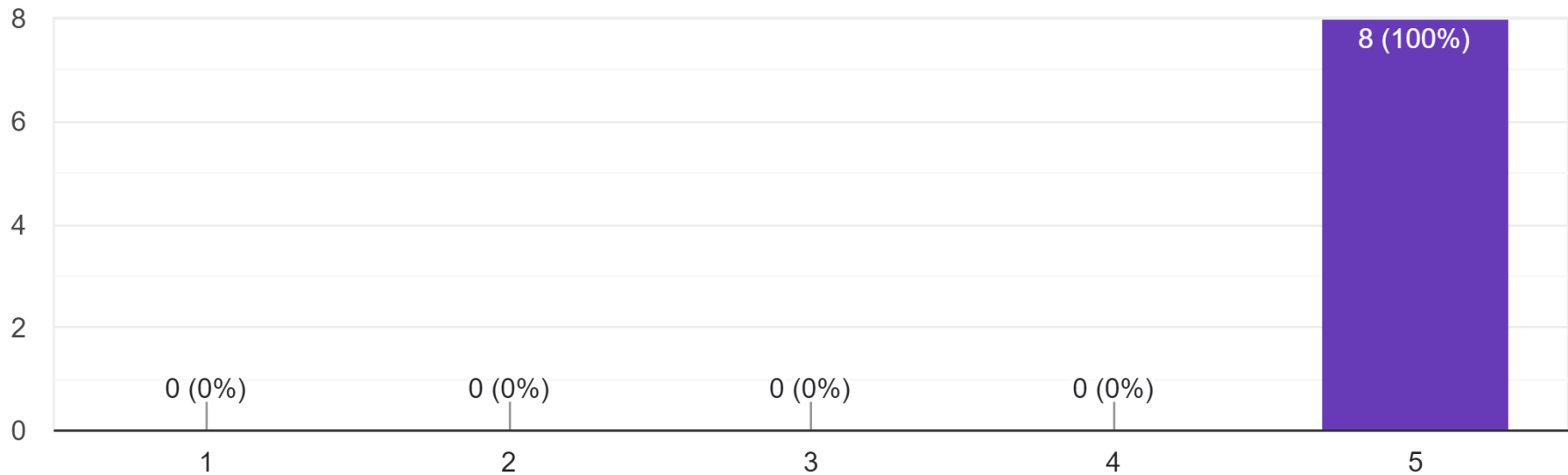
International Masterclasses

- **International Masterclasses are helping to make frontier science available to young students and teachers that otherwise would not have this opportunity.**
- **The larger audience is mainly high school students and teachers.**
- **QuarkNet collaborates with around 10 CMS Mexican scientists that participate regularly in masterclasses (contacting the teachers, planning the event, helping the students to analyze the data).**
- **Several high school teachers in different institutions in Mexico participate annually and help advertise the events in their local areas.**
- **Thanks to these collaborations, it was possible to continue with some events during the pandemic, which was appreciated by the students and teachers.**

Limited teacher survey: students like masterclasses

Califica esta afirmación: A mis alumnos y alumnas les gustó el Masterclass (5 significa que les gustó mucho y 1 significa que no).

8 responses

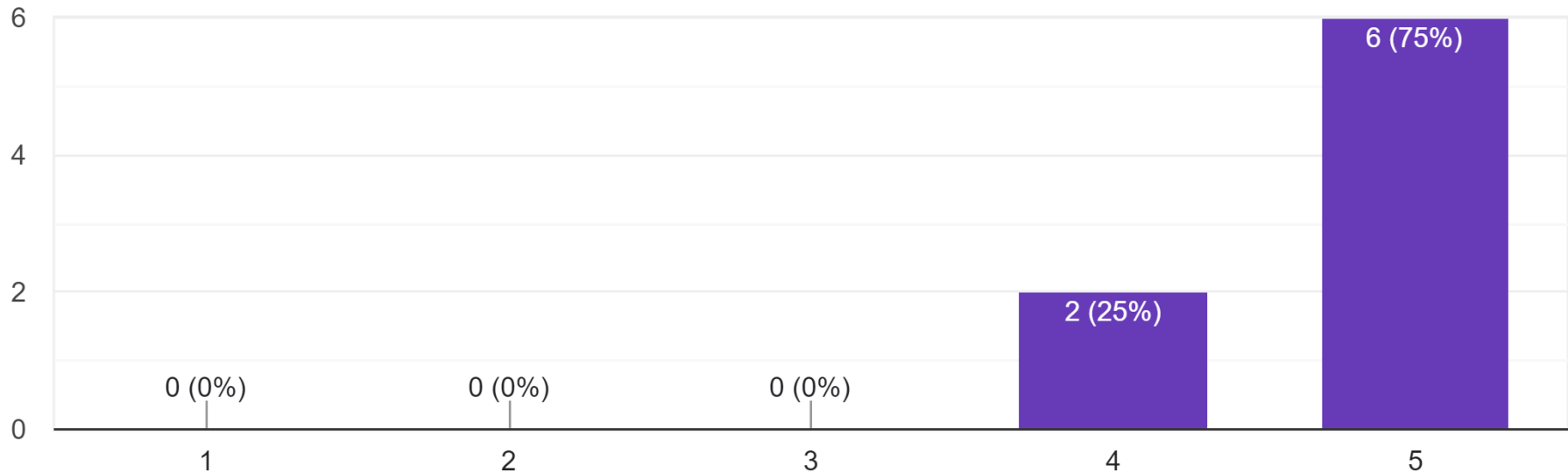


Translation: Evaluate this statement: My students liked the masterclass (5=very much, 1=no).

Limited teacher survey: students appreciate physics more

Califica esta afirmación: Mis alumnos y alumnas incrementaron su interés en física gracias al Masterclass (5 significa que concuerdo y 1 significa que no).

8 responses

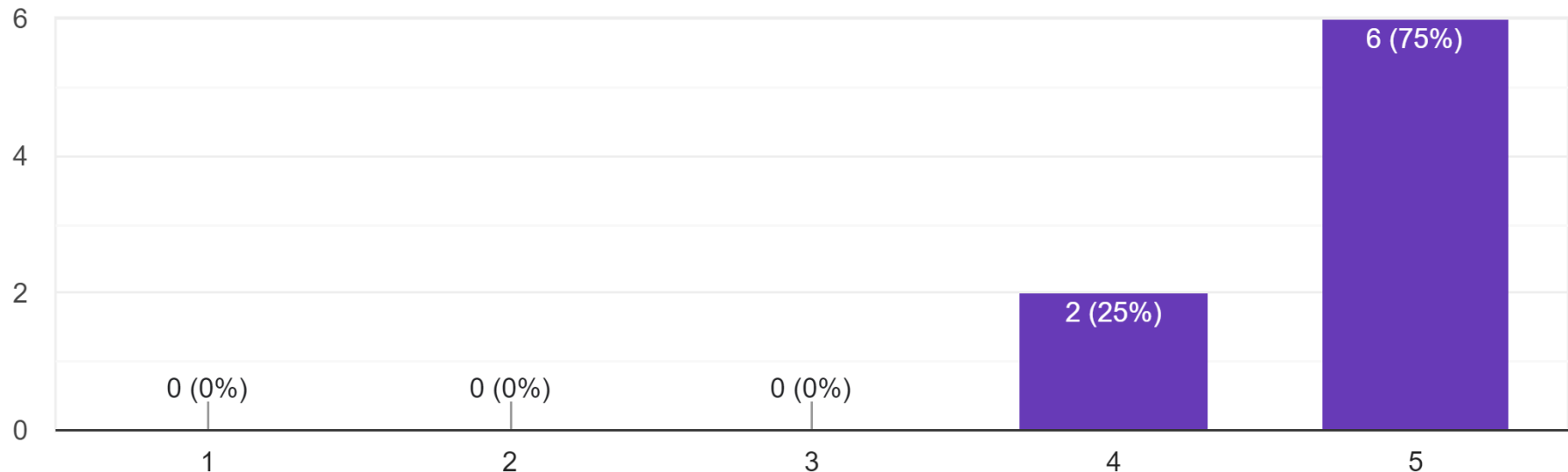


Translation: Evaluate this statement: My students' interest in physics increased thanks to the masterclass (5=agree, 1=no).

Limited teacher survey: teachers develop professionally

Califica esta afirmación: El Masterclass me ayudó en mi desarrollo profesional en pedagogía o física (5 significa que ayudó mucho y 1 significa que no).

8 responses

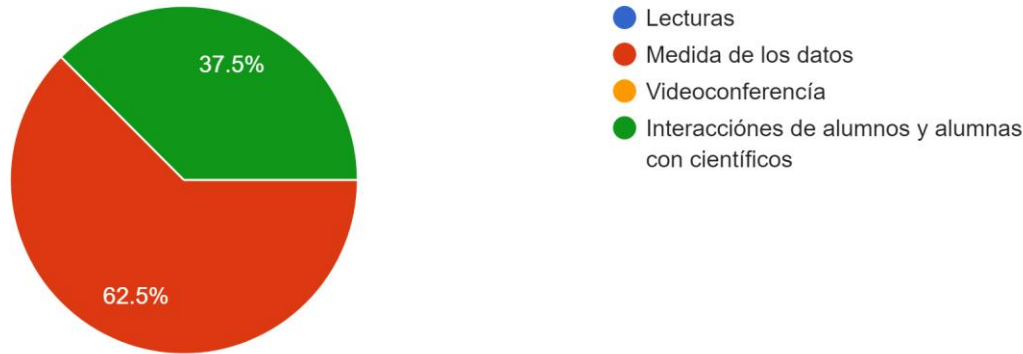


Translation: Evaluate this statement: The masterclass helped my professional development in teaching skills or physics (5=helped very much, 1=no).

Limited teacher survey: favorite and least favorite parts

¿Cuál fue la mejor parte del Masterclass?

8 responses



Translation: What was the best part of the masterclass?

- Lectures
- Data measurements
- Video conference
- Interactions between students and scientists

¿Cuál fue la parte del Masterclass que podría mejorarse?

8 responses

Translation: What part of the masterclass could be improved?

- Lectures
- Data measurements
- Video conference
- Interactions between students and scientists
- Availability of equipment.



The last time the students had to bring their own computers, and some were not adequate for the analysis.

Conclusions

- **Results have been positive and encouraging.**
- **Plans to work within a protocol to determine the reach and effectiveness of the activities in a more standardized way.**
- **Maintain statistics and collect feedback from teachers and students to improve activities.**
- **When data is available through teachers and schools, track students that were inspired from a masterclass to pursue a career in science.**
- **Although the program focuses on high school students, it is having a great impact on teachers (consider training activities for them as well?).**