

# Comunidad Mexicana de Aceleradores de Partículas (CMAP)

Bruce Yee-Rendon  
On behalf of CMAP



Mexican Community for Particle Accelerators (CMAP) was created in **2015** with the purpose of **promoting** and **developing** the area of **particle accelerators** in **Mexico** (and around the **world**).



## Goals:

- Establish **collaborations** with accelerator facilities abroad: CERN, JLab, LNLS, etc.
- Develop independent **research projects**.
- **Specialization** in different technical components or technologies specific for particle accelerators.

# Circular and linear colliders (Some example of the work members)

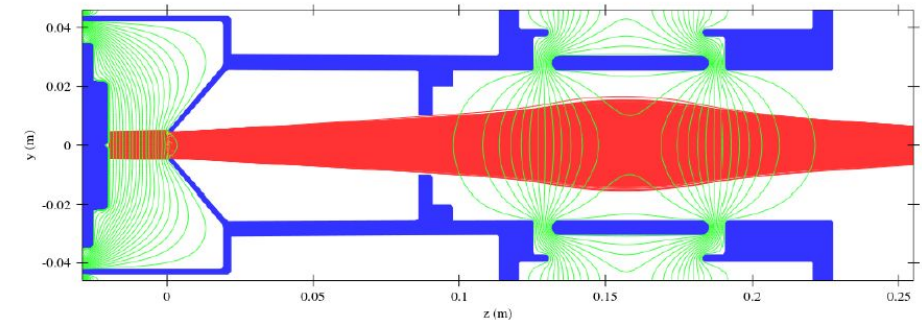


Name: **Cristhian Alfonso Valerio Lizarraga**

Affiliations: **Universidad Autonoma de Sinaloa**– Sinaloa, Mexico.

Institutions where develops his research: FCFM/UAS, **CERN**, **LINAC4**

Project subjects: **Particle Source Simulation and design, negative Ion beam, electron Rf Sources ,Plasmas Physics, and Beam Transport.**



Name: **Gerardo Guillermo Canton**

Affiliations: **IHEP** – Dongguang, China.

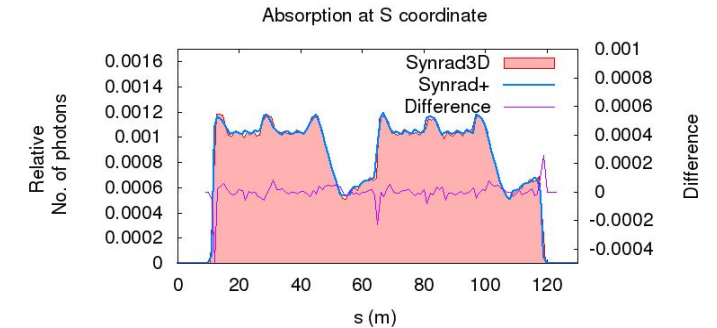
Institutions where develops his research:

**CSNS** Dongguang, China.

Project subject: **Design of a ultralow current proton beam line for testing detectors.**

**Areas of Interest:**

- Synchrotron radiation
- Beam transport line



Name: **Humberto Maury Cuna**

Affiliations: **U. de Gto** – Guanajuato, Mexico.

Institutions where develops his research:

**U. De Gto, CERN.**

Project subject: **Electron cloud.**

**Areas of Interest:**

- Collective effects.
- Electron cloud



# Source and electron accelerators (Some of the work members)



Name: **Juan Reyes Herrera**

Affiliations: **ESRF – Grenoble, France.**

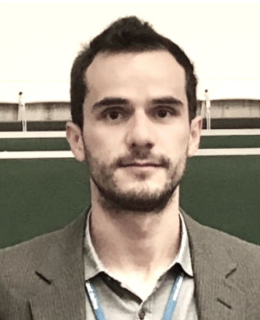
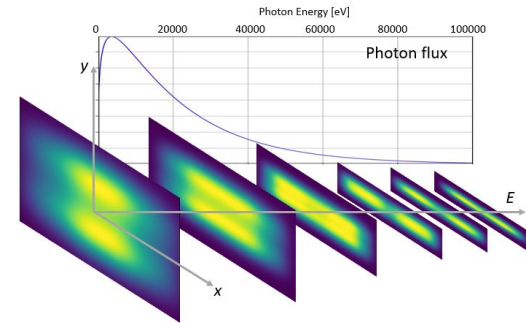
Institutions where develops his research:

**ESRF – Grenoble, France. FACITEC – Chihuahua, Mexico.**

Project Subject: **Simulations on beamline x-ray optics.**

**Areas of Interest:**

- X-ray spectroscopy techniques
- Synchrotron light sources
- Accelerator physics and its applications
- Machine learning and data mining



Name: **David Pavel Juarez Lopez**

Affiliations: **DESY Hamburg, Germany**

Institutions where develops his research:

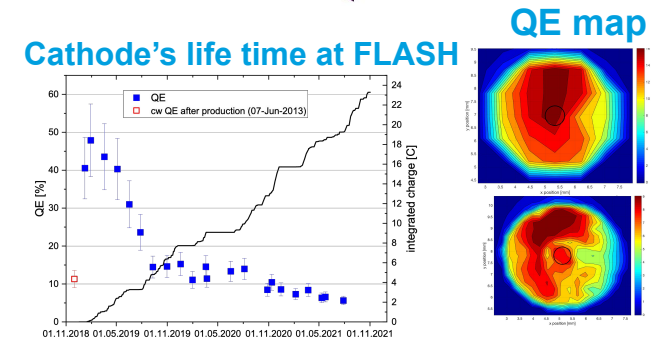
**FLASH - Free Electron Laser of Hamburg European**

**XFEL - European X-ray Free Electron Laser**

Project subject : **Photocathode production and characterization to minimize the electron main energy transverse energy and intrinsic emittance.**

**Areas of Interest:**

- Photocathode deposition
- Minimise intrinsic emittance
- X-ray free electron lasers



Name: **Anahi segovia Miranda**

Affiliations: **Laboratoire de Physique des 2 Infinis**

**Irène Joliot Curie– Orsay, France.**

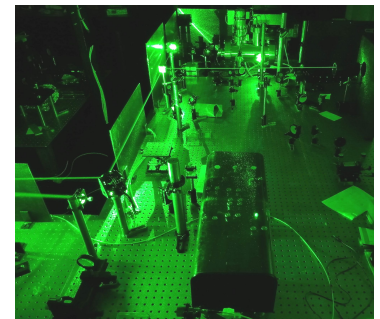
Institutions where develops his research:

**Institute – State, Country.**

Project subject : **Resonance ionization laser ion sources and study of nuclear magnetic moments**

**Areas of interest :**

- Radioactive ion beam production
- ISOL, Laser ionization
- Low Temperature Nuclear Orientation
- On-Line Nuclear Orientation
- Vacuum, Cryogenics



# Application of accelerator, technology transfer and industrial applications (Some of the work members)



Name: **Berenice Espinoza Gonzalez**

Affiliation: **Tecnologico Nacional de Mexico**, Campus Orizaba, Mexico.

Institutions where develops his research: **Tecnologico Nacional de Mexico**, Campus Orizaba, Mexico

Project Subject: **Introduction, develop, and trade of Technology in Latin America.**

**Areas of Interest:** Beam physics, synchrotron radiation.



Name: **Karla Cantu**

Affiliations: **UADY** – Yucatan, Mexico.

Institutions where develops his research:

**UADY** – Yucatan, Mexico.

**CERN Accelerator Systems RF-SRF** – Geneva, CH.

Project Subject: **Particle physics.**

**Areas of Interest:** Particle physics.

# Accelerator technology (Some example of the work members)

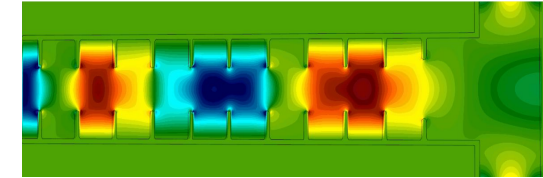


Name: **Salvador I. Sosa Güitrón**  
Affiliation: **University of New Mexico**  
Institutions where develops his research: **University of New Mexico - Albuquerque, NM. Brookhaven National Laboratory (User) - Upton, NY, Argonne Leadership Computing Facility (User) - Argonne, IL.**  
Project Subject: **AI for accelerator controls and C-Band accelerators.**

**Areas of Interest:** Machine Learning and controls, normal and superconducting RF for accelerators, beam dynamics.



*Front-end RFQ .*

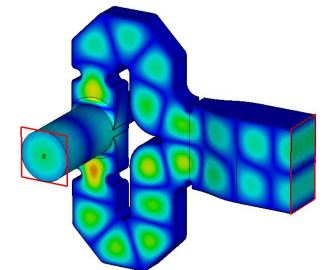
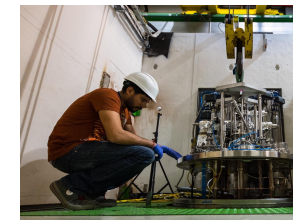


*EM simulation of a C-band, TW accelerator.*



Name: **Alejandro Castilla Loeza.**  
Affiliations: **Lancaster University – Lancaster, UK. CERN Accelerator Systems RF-SRF – Geneva, CH.**  
Institutions where develops his research: **CERN Accelerator Systems RF-SRF – Geneva, CH.**  
Project Subject: **Design and Operation of Superconducting and Normal Conducting Radiofrequency Cavities for Particle Accelerators.**

**Areas of Interest:** Superconducting RF, Beam Dynamics at the Interaction Region, Machine Operations.



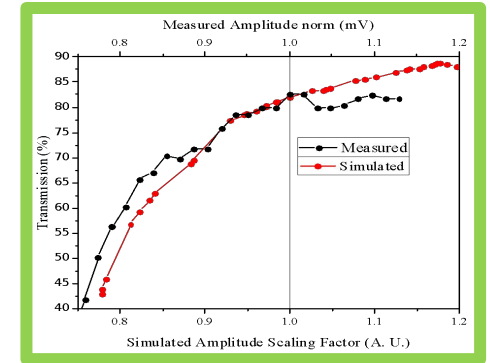
# Beam dynamics and EM fields (Some example of the work members)



Name: **Gaspar Ricardo Montoya Soto**  
Affiliations: **University of Guanajuato** – México  
**CERN** – Switzerland  
Institutions where develops his research:  
**CERN** – Meyrin, Switzerland, **JLAB** – Virginia, USA  
Project subject: **Low energy transfer lines, measurements and simulations**

## Areas of Interest:

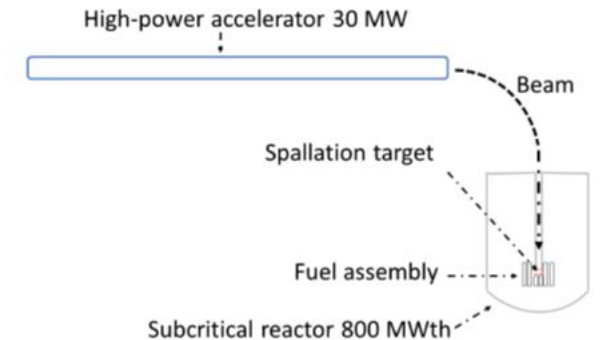
- Electron, positron and ion sources
- Space charge effects
- Electromagnetics field map models



Name: **Bruce Yee Rendon**  
Affiliations: **JAEA/J-PARC** – Ibaraki, Japan  
Institutions where develops his research:  
**J-PARC**– Ibaraki Japan.  
Project subject: **Accelerator driven subcritical systems**

## Areas of Interest:

- Beam optics,
- Cavity and RFQ design
- Machine protection
- High intensity proton linacs





# Mexican Particles Accelerator Schools (MePAS), workshops.

MePAS I, Sept 2011.



MePAS II, Nov. 2015



CMAP-ININ Workshop, Nov 2017.



MePAS III, Nov 2018.



MePAS IV, Nov 2020.

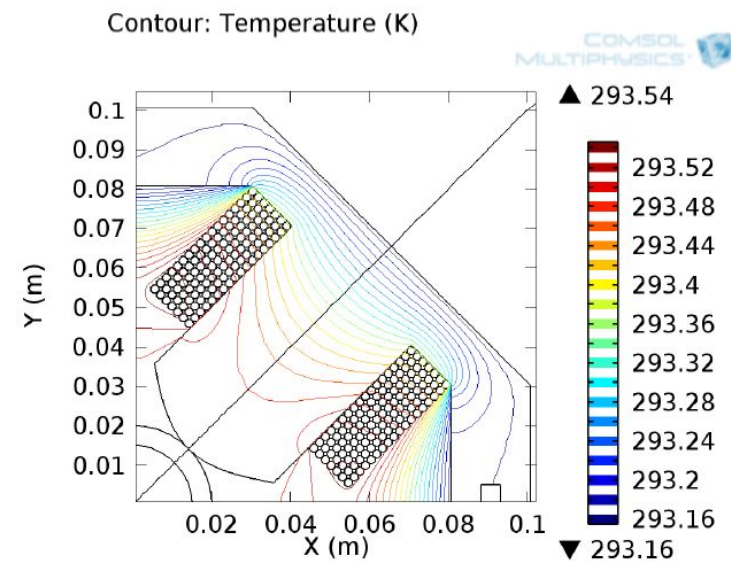
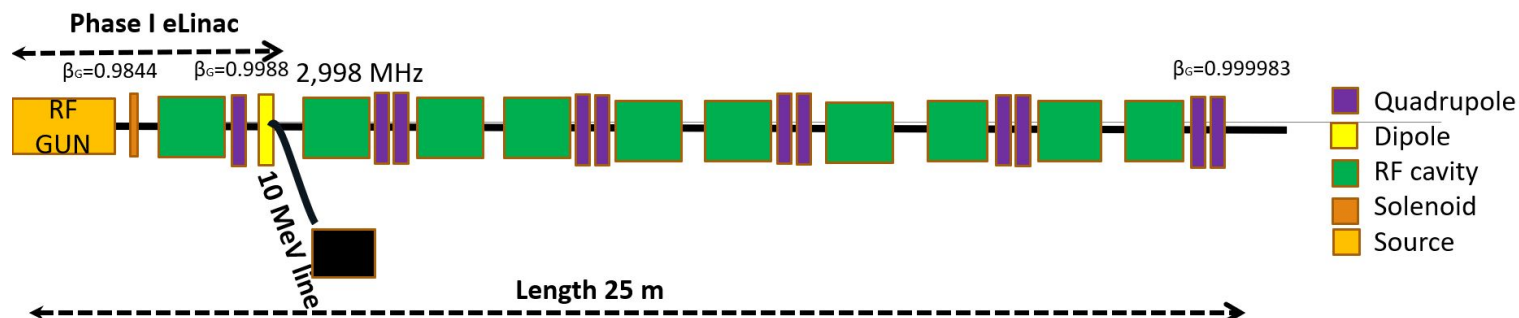
Postponed due to COVID-19.

12/16/2021

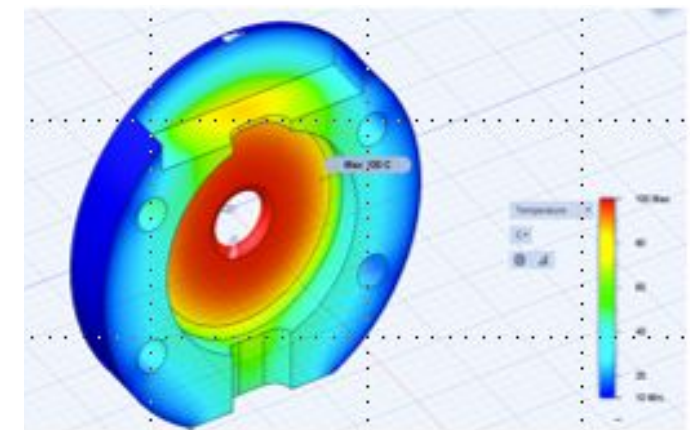
Inter-American NetWork of Network of QCD  
Challenges



# Design of electron linac



- C.A, et al. “Beam dynamics design of a 100 MeV electron RF linear accelerator “, LXIV Congreso Nacional de Fisica, 2021.
- G R Montoya-Soto, B. Yee-Rendon, C. Duarte-Galvan and C. A. Valerio-Lizarraga, “*Electromagnetic design and characterization of an S-band 3-cell rf acceleration cavity*”, J. Phys.: Conf. Ser. 1350 012190 (2019).
- C. A Valerio-Lizarraga, et al. “Study of the first Mexican RF linear accelerator”, Rev. Mex. Fis. 64, 116, 2018.
- D. Chavez, et al. “Field and Cost Optimization of a 5 T/m Normal Conducting quadrupole for the 10-MeV Beam Line of the Electron Linac of the Mexican Particle Accelerator Community”, J. Phys. Conf. Ser. 1067, 082014, 2018.
- C. A. Valerio-Lizarraga, et al. “Science and Technology of Accelerators”, J. Phys. Conf. Ser. 761, 012005, 2016.



# Regular activities

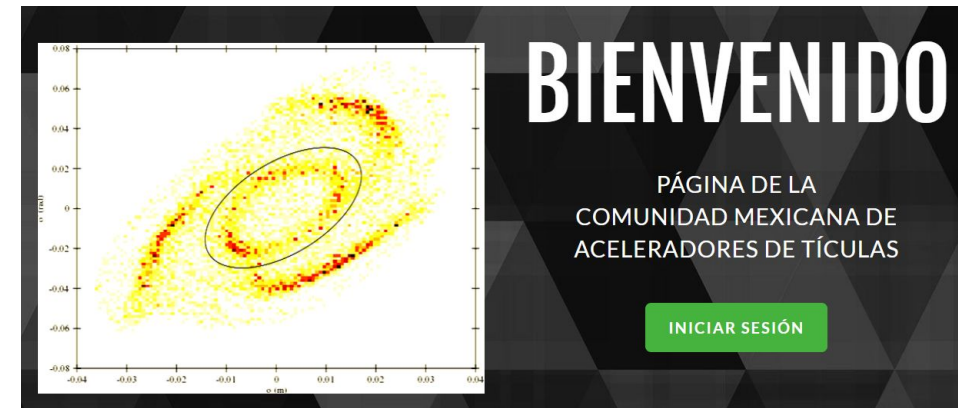
CMAP Seminars

Hot Topic

5 questions

Always looking for volunteers!!!

Website (<https://www.cmapweb.org/>)



Review committee for papers and work proposals.

# International collaboration



Coloquio Virtual de la  
Comunidad Mexicana de Aceleradores de Partículas:

**Mexican involvement in FCC accelerator R&D**

**MEXICO-CERN**  
Lunes Junio 21, 9:00 am (Cd. de México)

Agenda: <https://www.cmapweb.org/fcc-colloquium.html>  
<https://indico.cern.ch/event/1046809/>


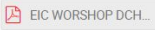
Zoom url:  
<https://cern.zoom.us/j/66183571070?pwd=VHBHTWZiZHdvSytXc3ZZVlpiSFE5Zz09>



## EIC Workshop – Promoting Collaboration on the Electron-Ion Collider

7 oct. 2020 0:00 → 9 oct. 2020 21:00 Europe/London

**Descripción** Cockcroft Institute of Accelerator Science and Technology, UK, working with the EIC project team, has hosted a virtual meeting on October 7-9, 2020 which focused on potential partnership in the EIC Project. The meeting has spanned over three days and included sessions spread over multiple time zones, making it easier for participants from the entire world to participate. Please visit workshop web-site: <https://www.cockcroft.ac.uk/events/eic20/> for more details.

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**21:00** **Superconducting magnet design in Mexico, challenges and opportunities** ⌚ 20m  
**Ponente:** Daniel Chavez (Universidad de Guanajuato )  
  

**22:20** **Mexican Universities Accelerator Science and Technology and EIC** ⌚ 20m  
**Ponente:** Humberto Maury Cuna (Universidad de Guanajuato (MX))  
 

## LASF4RI

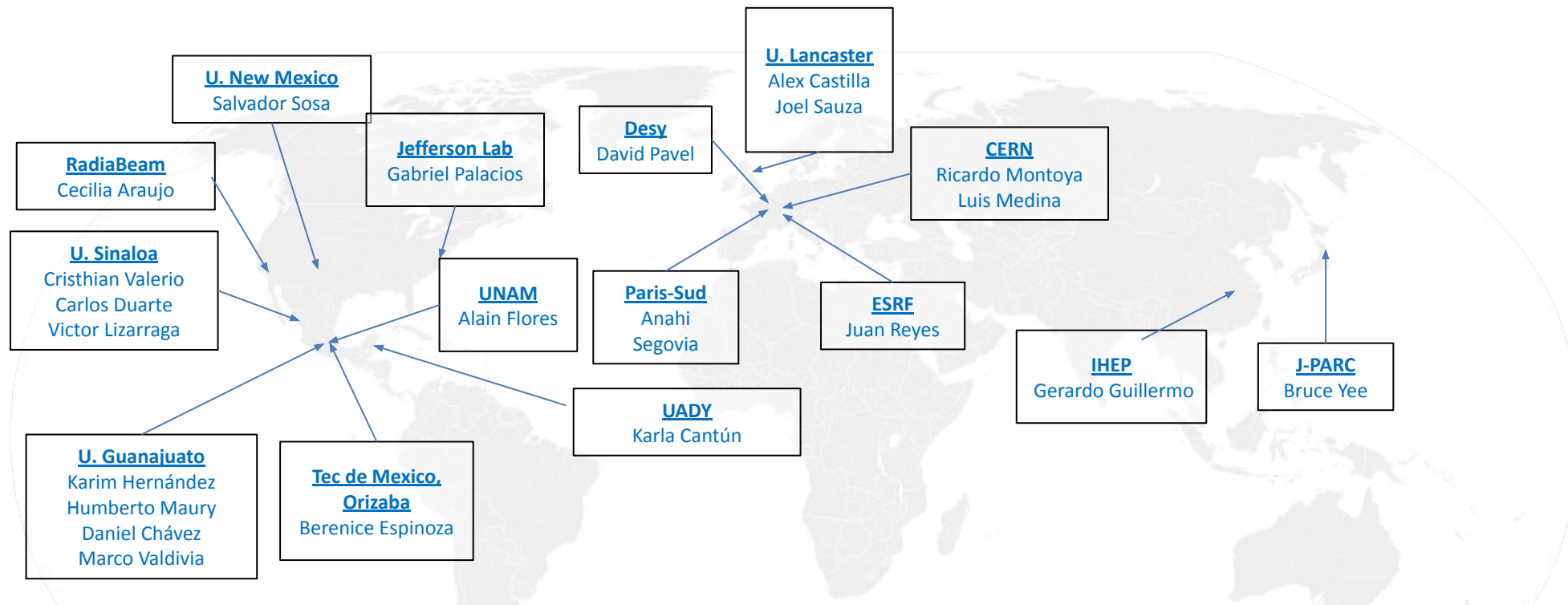


### Latin American Strategy Forum for Research Infrastructure

*Developing a strategy to strengthen Latin American Scientific Collaborations and their impact.*



# Distribution of CMAP members around the world



- CMAP members present in America, Europe, and Asia. And it keeps growing.
- We are always open to collaboration in order to develop the particle accelerator area in Mexico and around the world.
- Thanks for your attention!!!!