Undergraduate Engagement with a Focus on Diversity: DOE Lab Perspective

Olga L. Mayol-Bracero

Brookhaven National Laboratory

2023 ARM/ASR Joint User Facility and PI Meeting
August 8, 2023

U.S. DEPARTMENT OF ENERGY
Office of Science
ASR Atmospheric System Research
ARM
Brookhaven National Laboratory
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DOE RENEW: Reaching a New Energy Sciences Workforce Through Atmospheric Research at The University of Puerto Rico Rio Piedras (RENEW-AR-UPRRP)

University of Puerto Rico – Rio Piedras (UPR-RP)

- Minority Serving Institution, predominantly Hispanic (>95%)
- Only Puerto Rican institution certified as a R2 Doctoral Research University by the Carnegie Classification
- Ranked second in the list of institutions where Hispanic or Latino STEM PhDs had received their bachelor's degree (Melendez-Ackerman & Colon, 2022).

Engagement of UPRRP is important to increase underrepresented minorities, especially in the atmospheric sciences, where minority groups are underrepresented in relation to other STEM disciplines (McPhee, 2017).

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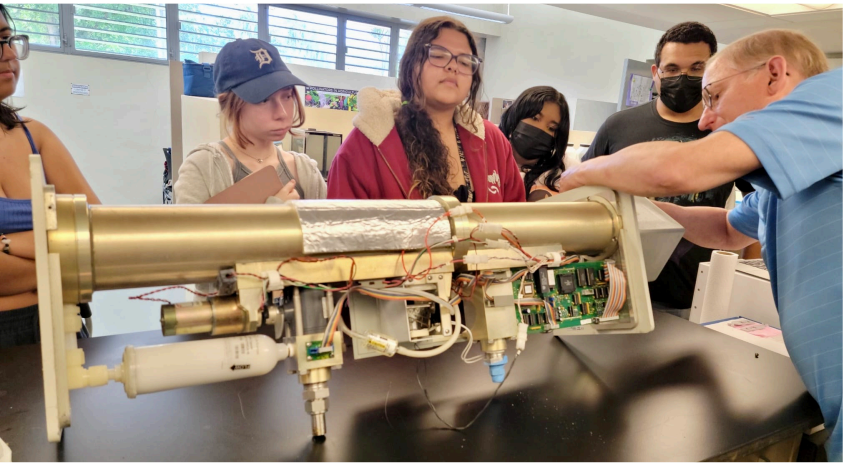
For the DOE national laboratories, there is more benefit than "just" the service of reaching out to an underserved community.

- Preparing students for careers where **they can contribute to and address the science challenges of DOE's Earth and Environmental Systems Sciences Division**.

- UPRRP is part of our team (benefit to both parties)
  - Contributor to BNL/ANL Science Focus Area "Process-level Advancements of Climate through Cloud and Aerosol Lifecycle Studies (PASCCALS)".
    - Reducing Uncertainty in Aerosol-Radiation Interactions (coarse mode – African dust)
      - BNL – observations (Olga Mayol-Bracero, Arthur Sedlacek III)
      - ANL – modeling (Yan Feng)
    - Puerto Rico and the Greater Caribbean Basin (GCB) are a 'natural laboratory' for studying the African dust properties after the long-range transport and interactions with clouds and precipitation.

For more info about the RENEW-AR-UPRRP see poster #115 (session #1) Melendez_Ackerman et al



DOE RENEW - Summer 2023 Workshop
San Juan, Puerto Rico
June 5-9, 2023

ASR Atmospheric System Research

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ARM

Reaching a New Energy Sciences Workforce Through Atmospheric Research at The University of Puerto Rico Rio Piedras (RENEW-AR-UPRRP)

June 5-9, 2023
San Juan, Puerto Rico

Topic: DOE-RENEW-SUMMER 2023
Time: This is a recurring meeting Meet anytime
Join Zoom Meeting
https://us06web.zoom.us/j/85637637129

Day 1: Monday, June 5 (CN 221)

10:00 am - 12:00 pm Orientation and Introduction to the RENEW program

Elvia Meléndez-Ackerman, University of Puerto Rico - Río Piedras

12:00 pm - 01:00 pm *Lunch Break*

01:00 pm - 01:20 pm Introductions

1:20-130p – Elvia Preparing for "DOE-RENEW at UPRRP"

01:30 pm - 02:30 pm Plenary: Piecing Together the Lifecycle of Biomass Burning Aerosols: BBOP, LASIC and ORACLES

Arthur J. Sedlacek, Brookhaven National Laboratory

02:30 pm - 03:00 pm DOE and the RENEW program

Shaima Nasiri, Program Manager, DOE Atmospheric System Research (ASR), RDPP, FAIR, RENEW, Earth and Environmental Systems Science Division, Office of Biological and Environmental Research ***(via Zoom)***

https://us06web.zoom.us/j/85637637129

03:00 pm – 03:30 pm Environmental & Climate Science at DOE National Laboratories

Allison McComiskey, Brookhaven National Laboratory, Chair of Environmental and Climate Sciences Department: Environmental & Climate Science at DOE National Laboratories ***(via Zoom)***

https://us06web.zoom.us/j/85637637129

03:30 pm - 03:45 pm *Coffee Break*

03:45 pm - 04:45 pm African dust research in the Caribbean: Integration of aerosol ground-based measurements, satellite observations, and forecast models during the "Godzilla" dust event

Olga Mayol-Bracero, Brookhaven National Laboratory

Day 2: Tuesday, June 6 (CN 221)

09:00 am - 10:00 am Measurements of Aerosol Light Scattering and Absorption

John A. Ogren, NOAA Global Monitoring Laboratory

10:00 am - 10:15 am *Coffee Break*

10:15 am - 11:15 am Global Modeling of Dust Aerosols in the Earth System

Yan Feng, Argonne National Laboratory ***(via Zoom)***

https://us06web.zoom.us/j/85637637129

11:15 am - 12:00 pm Measurement of fluorescing aerosol particles using the Wideband Integrated Bioaerosol Spectrometer (WIBS)

Bighnaraj Sarangi, University of Puerto Rico - Río Piedras

12:00 pm - 01:00 pm *Lunch Break*

01:00 pm - 03:00 pm Hands-on activities **(FB003)**

Continuous Light Absorption Photometer (CLAP) and Nephelometer

John A. Ogren, NOAA Global Monitoring Laboratory

03:00 pm - 03:15 pm *Coffee Break*

03:15 pm - 04:30 pm Hands-on activities

SP2-XR

Arthur J. Sedlacek, Brookhaven National Laboratory

Day 3: Wednesday, June 7 - (please arrive at 7:15a behind the Natural Sciences Library (NCN)

7:30 am-04:00 pm Field Trip to CSJ & PDE atmospheric observatories

9:00 am – 12:00 pm CSJ Atmospheric Observatory

12:00 – 1:00 pm Lunch

2:00 pm – 4:00 pm PDE Atmospheric Observatory

Day 4: Thursday, June 8 (CN 221)

09:00 am - 10:00 am Aerosol remote sensing and synergies with surface sampling

Allison McComiskey, Brookhaven National Laboratory ***(via Zoom)***

https://us06web.zoom.us/j/85637637129

10:00 am - 10:15 am *Coffee Break*

10:15 am - 11:30 am – 15-min talks **(via Zoom)**
https://us06web.zoom.us/j/85637637129

10:15 am – 10:30 am - *Brent Holben* - AERONET
10:30 am – 10:45 am -*Tom Hanisco* - PANDORA
10:45 am – 11:00 am - *Judd Welton* - MPLNET
11:00 am – 11:15 am - *Hongbin Yu* - MODIS
11:15 am – 11:30 am – Questions and Answers

11:30 am – 12:30 pm Chemical characterization of atmospheric Particles by off-line methods of analysis.

Alexander Laskin, Purdue University

12:30 pm - 01:30 pm *Lunch (UPR-BNL lunch meeting -Jess, Elvia, Olga, Art)*

01:30 pm - 02:30 pm Hands-on activities **(CN 221)**

Aerosol sampling using Cascade Impactor with sample data analysis

Felipe Rivera, Purdue University

02:30 pm – 3:00 pm *Coffee Break*

03:00 pm – 4:30 pm Panel **Careers Transitions in Atmospheric Sciences**

Allison McComiskey, manager at BNL (former field atmospheric scientist) **(Via Zoom)** *https://us06web.zoom.us/j/85637637129*

Art Sedlacek, atmospheric scientist, BNL (field and lab atmospheric scientist)

Olga Mayol-Bracero, atmospheric scientist at BNL (former professor at UPR-RP)

Felipe Rivera-Adorno, Graduate student, Purdue University (former undergrad student at UPR-RP)

5:30 pm – 7:30 pm Meeting/Dinner RENEW staff (only per invitation)

Day 5: Friday, June 9 (CN 221)

(Students are required to bring laptops or have access to PCs on this day)

09:00 am-10:15 am Navigating the DOE ARM Data Discovery, and tools available from ARM Data Quality Office

*Ken Kehoe, Assistant Manager, DOE ARM Data Quality Office (via Zoom)**

https://us02web.zoom.us/j/81251352857?pwd=ZndtbGZYdkd6azRZYkxxWGlKS2txdz09

***please not that this link is different from the one used in prior days.**

10:15 am-10:30 am *Coffee Break*

10:30 am-11:45 am Aerosol Databases: GAWSIS, EBAS, ACTRIS

John A. Ogren, NOAA Global Monitoring Laboratory

12:00 pm-01:00 pm *Lunch Break*

01:00 pm-04:00 pm Python Tutorial Evaluation of computer skills and Python, Distributions and IDE, and Python basics with colab/JupyterHub

Denny S. Fernández, University of Puerto Rico-Humacao

- Benefit not only for the UPRRP students, but also for the professors in their role as mentors (e.g., data science workshop, DOE science)
- Benefit not only for UPRRP but also for BNL and ANL scientists (e.g., students have been assigned with research projects that advance our SFA)
  - African dust event observed in PR and at ARM field campaign TRACER
  - ENA and Puerto Rico African dust observations

We are working with, and training, students and early career scientists who we hope can be our colleagues and co-workers in the future. That was my experience!

BNL Visiting Faculty Program
(Summers of 2016-2018)

- Working with Art Sedlacek and Ernie Lewis (Env and Climate Sciences Dept)
- Bringing with me undergraduate and graduate UPRRP students.
- Project with ARM AOS data from GOAmazon.
- The VFP was the beginning of a long-term collaboration between UPRRP and BNL.

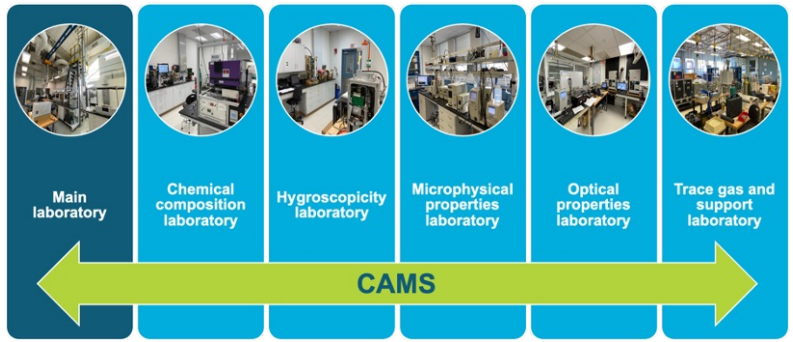
Art and Ernie in Puerto Rico, February 2017

Brookhaven National Laboratory

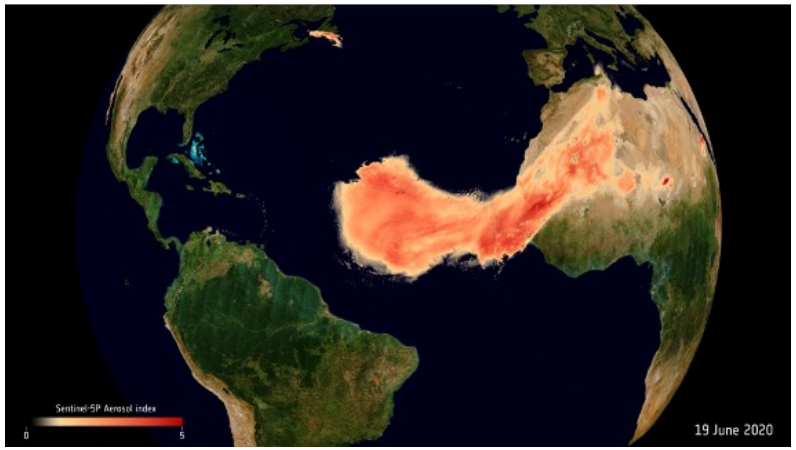
ACAR Atmospheric Chemistry and Aerosols Research

Few years after my VFP experience, I ended up as an atmospheric scientist at the Brookhaven National Laboratory.

Lead Mentor of the DOE Atmospheric Radiation Measurement (ARM) User Facility Aerosol Observing System (AOS)



Lead of the Center for Aerosol Measurement Science (CAMS)



Research on African dust and its impacts on climate

Still collaborating with UPRRP