

# YAÍTZA LUNA-CRUZ, Ph.D.

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## EDUCATION

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2008 to 2013                      Howard University                      Washington, D.C.

Ph.D. in Atmospheric Sciences with concentration in Atmospheric Physics

- Comprehensive Exam Specialization: Atmospheric Physics.
- Dissertation Date: September 30, 2013. Graduation Date: December 2013.
- Thesis: “*Aerosols-Cloud-Microphysics Interactions in Tropical Cyclone Earl*”
- Advisors: Gregory Jenkins (Howard University), Andy Heymsfield (NCAR-MMM) and Gregory Thompson (NCAR-RAP)
- GPA 3.93

2003 to 2008                      University of Puerto Rico-Mayagüez                      Mayagüez, P.R.

Master in Science - Physics

- Graduation Date: June 13, 2008.
- Thesis: “*Optical and Radiative Properties of Aerosols over Puerto Rico using the Multifilter Rotating Shadow-band Radiometer*”
- Advisor: Carlos U. Pabón-Ortiz
- GPA 3.53
- Completed the Atmospheric Sciences and Meteorology Program

1998 to 2003                      University of Puerto Rico                      Mayagüez, P.R.

B.S. in Theoretical Physics

- GPA 2.96

## RESEARCH AREAS AND TECHNICAL INTERESTS

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Atmospheric Physics, Meteorology, Atmospheric Transport Models, DoD, CBRN hazard analysis, GIS, First Response Disaster Support (hurricanes, earthquakes, flood, tornados, major fires), Cloud Physics (Microphysics), Atmospheric Radiation (Cloud/Aerosols Forcing), Tropical Cyclones (Genesis and Intensification Processes), Aerosols-Cloud-Microphysics Interactions in Tropical Environments, Saharan Air Layer Microphysics, Airborne Observations (Microphysics, Radar, Dropsondes and LIDAR), Remote Sensing Observations (Ground and Satellite), Numerical Weather Modeling (WRF, cloud microphysics schemes) and Education and Outreach.

## SKILLS

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- Language Skills: Full English and Full Spanish.
- General Skills: TS Clearance, Leadership. Educator. Creative. Strong background in physics and mathematics. Ability to organize, analyze and interpret data. Ability to understand and explain physical and mathematical concepts. Good communication and social skills. Ability to perform independently and in teams. Ability to understand the methods and procedures for conducting scientific research. Ability to travel as needed.
- Computer skills: HPAC, GIS, ArcMap, HAZUS, IMEA, VAPO, MATLAB, LATEX, UNIX/LINUX, FORTRAN, NETCDF, Vi, WRF-ARW, GRADS, NCL, RIP4 and Windows Microsoft (Excel, Word, PowerPoint).

## WORK & RESEARCH EXPERIENCE

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### 2014- Current

- 2015-Current Applied Research Associates (ARA) – Defense Threat Reduction Agency (DTRA) Technical Reachback, Fort Belvoir, VA.
- 2014-2015 Engility Corporation – Defense Threat Reduction Agency (DTRA) Technical Reachback, Fort Belvoir, VA.
- Position: Atmospheric Physicist/ Meteorologist
- Job Description: Provide operational support, research and development support, training support, and subject matter expert advice and decision support to the DTRA as part of its Combating Weapons of Mass Destruction (CWMD) Reachback contract. The work is part of the CBRNE Command (Chemical, Biological, Radiological, Nuclear and high- yield Explosives).
- Program Manager: James Hodge, Ph.D.

### 2014

- EcoExploratorio Inc. Future Museum of Science of Puerto Rico.
- Job Description: Development of educational material for the first educational/scientific exhibition.
- Director: Ada Monzon, Meteorologist.

### 2008 to 2013

- NOAA Center for Atmospheric Sciences doctoral fellow at Howard University, Washington, DC.
- Job Description: Researcher in atmospheric physics (Field experiments and educational outreach activities).
- Research Topic: Aerosols-cloud-microphysics interactions in tropical cyclones using aircraft measurements and WRF simulations.
- NCAS PI: Vernon Morris, Howard University.
- Advisor: Gregory Jenkins, Howard University.

### Summer 2012

- Graduate Visitor at NCAR
- Job Description: Research using the new Aerosols-Aware microphysics scheme in WRF-ARW (simulations of hurricane Earl 2010).
- Advisor: Andrew Heymsfield, NCAR-MMM and Greg Thompson, NCAR-RAP.

### Summer 2012

- NSF Ground Measurements Network in SAL, Cape Verde and Dakar, Senegal
- Job Description: Installation and Calibration of Multifilter Rotating Shadow-band Radiometer network.
- Research Topic: Aerosols, radiation, dust properties, Saharan Air Layer physics and dynamics.
- Advisor: Gregory Jenkins, Howard University.

### Summer 2011

- Ice in Clouds Experiment – Tropical (ICE-T), St. Croix, Puerto Rico and Atlantic Region.
- Job Description: Characterization of the microphysical and chemical properties of the first ice formation in tropical convection systems using NCAR C-130 aircraft (Flight hours - 48).
- Research Topic: Airborne science, atmospheric physics, cloud microphysics, remote sensing, instrumentation, tropical convection system, first ice formation, ice nuclei, aerosols-microphysics interaction and giant aerosols sources.
- Advisor: Andrew Heymsfield, NCAR-MMM.

### Spring 2011

- NCAR Advanced Study Program (ASP) – Graduate Visitor Program
- Job Description: Data analysis for GRIP microphysics measurements.
- Research Topic: Atmospheric physics, cloud microphysics, remote sensing,

- instrumentation, tropical convection system.
  - Advisor: Andrew Heymsfield, NCAR-MMM.
- Summer 2010
- NASA Genesis and Rapid Intensification Process (GRIP) Field Experiment, California, Florida, St. Croix and Atlantic Region.
  - Job Description: Characterization of the microphysical properties of the liquid and ice phase of cloudy regions of Atlantic Hurricanes from the NASA DC-8 aircraft (Flight hours – 139).
  - Research Topic: Airborne science, atmospheric physics, cloud microphysics, remote sensing, instrumentation, tropical meteorology and tropical cyclones.
  - Advisor: Andrew Heymsfield, NCAR-MMM and Aaron Bansemer, NCAR-MMM.
- Summer 2010
- Multisite Transatlantic Ozone Field Experiment 2010, St. James, Barbados.
  - Job Description: Ozonesonde preparation, launchings and monitoring.
  - Research Topic: Atmospheric dynamics, atmospheric chemistry and meteorology.
  - Ozonesonde preparation, launchings and monitoring.
  - Advisor: Gregory Jenkins, Howard University.
- Summer 2009
- NASA - National Suborbital Education and Research Center (NSERC) Student Airborne Research Program (SARP), Palmdale, California.
  - Job Description: Atmospheric Processing for MASTER Imagery using Chemical Transport Models and MODTRAN 4.
  - Research Topic: Airborne science (onboard NASA DC-8, Flight hours - 12), atmospheric physics, atmospheric chemistry, meteorology and oceanography.
  - Advisor: Nicholas Clinton, NASA.
- 2005 to 2008
- NOAA Center for Atmospheric Sciences at the UPR-Mayagüez, Mayagüez, Puerto Rico.
  - Job Description: Researcher in tropical meteorology, Multifilter Rotating Shadowband Radiometer maintenance and data processing, DAVIS Weather Station maintenance and data processing and Puerto Rico Weather Camp Co-Organizer.
  - Research Topic: Effects of Saharan Air Layer aerosols in tropical meteorology.
  - Advisor: Everette Joseph, Howard University, Roy Armstrong, UPRM, Yamín Detrés, UPRM and Carlos U. Pabón, UPRM.
- 2006
- University of Puerto Rico at Mayagüez & Department of Education of Puerto Rico: AFAMaC Program
  - Job Description: CinYMateCa Tutor (middle school teachers and students), Physics shows (middle schools).
  - Supervisor: José R. López, UPRM.
- 2003-2005
- University of Puerto Rico at Mayagüez, Department of Physics - Optics Laboratory.
  - Job Description: Researcher in optics and atmospheric turbulence (lab and field experiments).
  - Advisor: Mark Chang, UPRM.
- 2005
- University of Puerto Rico at Mayagüez, Department of Physics.
  - Job Description: Teaching Assistant (TA in General Physics Lab I and Lab II).
  - Supervisor: José R. López, UPRM.
- Summer 2004
- GENE Center at Hunter College of The City University of New York.
  - Job Description: Researcher in biophysics (electron tunneling in proteins).

- Advisor: Siu Tung Yau, CUNY.

#### Summer 2001

- REU (Research Experiences for Undergraduates) internship at University of Puerto Rico (UPR), Humacao Campus.
- Research Field: Gravitational physics: Weyl Gravity Theory.
- Advisor: Ernesto Esteban, UPRH.

### PUBLICATIONS

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- Jenkins, G. S., M. L., Robjhon, B. Demoz, W. R., Stockwell, S. A., Ndiaye, M., Drame, M., Gueye, J. W., Smith, Y., **Luna-Cruz, J.**, Clark, J., Holt, C., Paulin, A., Brickhouse, A., Williams, A., Abdullah, A., Reyes, L., Mendes, H., Lopes, A., Valentine and M., Camara, 2013: *Multi-site tropospheric ozone measurements across the north Tropical Atlantic during the summer of 2010*. Atmospheric Environment, Vol. 70, 131-148.
- Tkacik, D.S., Y. Luna-Cruz, N. Clinton, S. Spak and J. Ryan, 2012: *Atmospheric correction for MASTER image data using localized modeled and observed meteorology and trace gases*. Remote Sensing Letters, Vol. 3, No.3, 201-209.
- Chang, M., Santiago, F., Font, C. O., **Luna, Y.**, Roura, E., and Restaino, S., 2004: *Horizontal path propagation measurements over the sea*. SPIE 5491, p 1274.
- Chang, M., Santiago, F., Font, C. O., **Luna, Y.**, Roura, E., and Restaino, S., 2004: *Marine environment optical propagation measurements*. SPIE 5550, p 40.

### AFFILIATIONS

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- American Meteorological Society - Member since 2006 (UPRM Student Chapter, GSAAS-HU Student Chapter and DC-AMS Professional Chapter)
- American Geophysical Union - Member since 2010
- Golden Key International Honour Society - Member since 2011
- Latino Student Fund Professional Group - Member since 2012

### AWARDS

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- NCAR/ASP Graduate Visitor Program Award. From April 2011 to July 2011. Boulder, Colorado.
- City Mayor Cup Award 2010 for outstanding job representing Puerto Rico as a young scientist. Cidra, Puerto Rico.
- NOAA-Educational Partnership Program Science Forum Award, Howard University, Washington, DC. Student Poster Competition: 1st Place. Poster: "Atmospheric Processing for MASTER Imagery using Chemical Transport Models and MODTRAN4".
- Alfred P. Sloan Scholarship: Minority PhD Program in Mathematics, Sciences and Engineering.
- NOAA Center for Atmospheric Sciences (NCAS) Fellowship Award at Howard University, Washington, DC.

### CERTIFICATES

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WRF-ARW, HPAC, GIS, HAZUS, IMEA, VAPO

## ACTIVITIES AND PRESENTATIONS

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2014

- 94<sup>th</sup> American Meteorology Society (AMS) Annual Meeting, Atlanta, GA.
- Oral Presentation: “*Aerosol-Aware Bulk Microphysics Scheme: A sensitivity study of Hurricane Earl*”

2013

- 67th IHC Tropical Cyclone Research Forum, NCEP, College Park, MD
- Poster Presentation: “*Aerosols-Cloud-Microphysics Interactions in Tropical Cyclone Earl*”

2013

- 93<sup>rd</sup> American Meteorology Society (AMS) Annual Meeting, Austin, TX.
- Poster Presentation: “*Aerosols-Cloud-Microphysics Interactions in Tropical Cyclones using the WRF-ARW model with a new Aerosol-Aware Microphysics Scheme*”

2012

- 92<sup>nd</sup> American Meteorology Society (AMS) Annual Meeting, New Orleans, LA.
- Oral Presentation: “*Cloud Microphysics and Hurricane Genesis up Close: Experiences From the GRIP (2010) and ICE-T (2011) Field Campaigns*”

2012

- Weather Research & Forecasting Tutorial, Boulder, CO.

2011

- American Geophysical Union (AGU) Annual Meeting, San Francisco, CA.
- Poster Presentation: “*Studying the Influence of the SAL in the Evolution of Cloud Microphysics Processes Associated with Tropical Cyclone Earl Using Airborne Measurements from the NASA GRIP Field Campaign 2010*”.

2011

- Golden Key International Honour Society Member Recognition Ceremony, Howard University, Washington, DC.

2011

- First International Workshop on the Long Range Transport and Impact of African Dust on the Americas, San Juan, Puerto Rico.
- Poster: “*Studying the Influence of the SAL in the Evolution of Cloud Microphysics Processes Associated with Tropical Cyclone Earl*”.

2011

- American Association for the Advancement of Science (AAAS) Annual Meeting, Washington, DC.
- Poster: “*Studying the Influence of the SAL in the Evolution of Cloud Microphysics Processes Associated with Tropical Cyclone Earl Using Airborne Measurements from the NASA GRIP Field Campaign 2010*”.

2010

- Howard University Graduate School Research Symposium, Washington, DC.
- Oral Presentation: “*Investigating the Impact of Saharan Dust on Tropical Cyclones using Airborne Measurement from the NASA DC-8*”.

2009

- 89<sup>th</sup> AMS Annual Meeting, Phoenix, Arizona
- Student Poster Section: “*Optical and Radiative Properties of Aerosols over Southwestern Puerto Rico*”.

2008

- NOAA Center for Atmospheric Sciences (NCAS) Fellowship at Howard University, Washington, DC.

2008

- 88<sup>th</sup> AMS Annual Meeting, San Antonio, Texas – UPR-Mayagüez Student Chapter
- Local Chapter Poster Competition: 2<sup>nd</sup> Place

2007

- 87<sup>th</sup> AMS Annual Meeting, New Orleans, Louisiana – UPR-Mayagüez Student Chapter
- Local Chapter Poster Competition: 2<sup>nd</sup> Place

2006-2007

- American Meteorological Society (AMS) – Member since 2006.
- UPRM Student Chapter of the AMS Founder and First President.

## REFERENCES LIST

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Mark Jordan  
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703-924-0746  
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Associate Scientist  
303-497- 2805  
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NASA-National Suborbital Education & Research Center  
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