APS physics™

American Physical Society New England Section Newsletter

Editors
James O'Brien
Peter K. LeMaire

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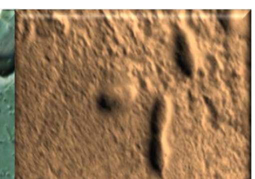
Volume 24, No. 1 **Spring 2018**

Spring 2018 APS-NES Meeting, March 16-17, 2018, Suffolk University, Boston MA



Theme: Physics leading frontiers in Planetary Science and Astrobiology

With new discoveries of exoplanets and in biophysics, our understanding of principles behind life processes in the universe is rapidly changing. Crucial questions about planetary systems ranging from the abundance of elements like carbon, to the emergence of life, have so far been based on observations and models from Earth. However, new discoveries and reevaluation of physical constraints to life has opened new frontiers for scientific exploration. This includes recent advances in astrophysical techniques that lead to discovery of new worlds, development of new biophysical techniques to learn about life in extremes, novel methods to recognize bio-signatures, and the science behind planetary habitability. We focus on Physics based topics related to astrophysics and biology that include some relation to planetary habitability. The 2018 APS New England Section meeting will have a **special inaugural session of invited talks on Friday, March 16,** on the theme: Physics leading frontiers in Planetary Science and Astrobiology.

The invited speakers for the inaugural session are:

Prof. Sara Seager – MIT, Planetary Science and Physics
Dr. Juan Perez-Mercader – Harvard University, Origins of Life Initiative
Dr. Jane Luu – MIT Lincoln Labs
Dr. Enric Palle – Instituto de Astrofisica de Canaries, Tenerife
Dr. Anurag Sharma—Suffolk University, Boston

The inaugural session will be followed by a poster session and dinner. On Saturday, March 17, there will be a **special invited talk** by Robert Kleinberg, 2018-2019 APS Distinguished Lecturer on the Applications of Physics. This will be followed by contributed talks on a wide variety of topics in physics.

Recap of the Fall 2017 APS-NES meeting at URI

Cameron Goodwin giving invited talk on "Current Research Efforts at The Rhode Island Nuclear Science Center"

The Fall 2017 meeting of the New England Section was held at the University of Rhode Island in Kingston, RI. The theme was "physics with applications in industry." The keynote speaker, Dr. Rudolf Tromp, gave advice for students and shared experiences from his career in industry. Other invited speakers included two scientists working on new batteries (Joseph Woicik from NIST, Benjamin Young from Rhode Island College), the director of the Rhode Island Nuclear Science Center (Cameron Goodwin) and a scientist working on nanoelectronics (Ali Gokirmak). Contributed talk speakers and poster presenters gave excellent and interesting presentations on a range of physics topics. Beyond the scientific presentations, attendees had the opportunity to view physics lab equipment on the "food truck for the physics mind", by TeachSpin. The SYREN modern dance troupe presented a very interesting interpretive dance based on quantum mechanics, and facilitated a discussion afterwards. We received an increased attendance of industrial physicists, and saw a new set of connections made between academic and industrial physicists.

The meeting opened with a welcome address which was given by the Provost of URI. The provost discussed building stronger relationships between industries and URI, in line with the universities' strategic goal is to build partnerships in multiple disciplines. The new buildings at URI and infrastructure is based around engineering and industry partnerships, with strong support from local companies, using a business engagement center with faculty staff and students with a single goal in mind: A portal for contact which alleviates red tape.

The day continued with the first speaker, Cameron Goodwin, of the Rhode Island nuclear science center. Not many people even know that RI has a nuclear presence, and one of only 28 research nuclear facilities associated with universities and the 3rd highest power level strictly for the use of research and education. The facilities' high amount of community outreach for nuclear education was highlighted. The facility is open to collaborations and for more information, please contact:
Cameron Goodwin, Director
cgoodwin@rinc. ri. gov 401-874-2600

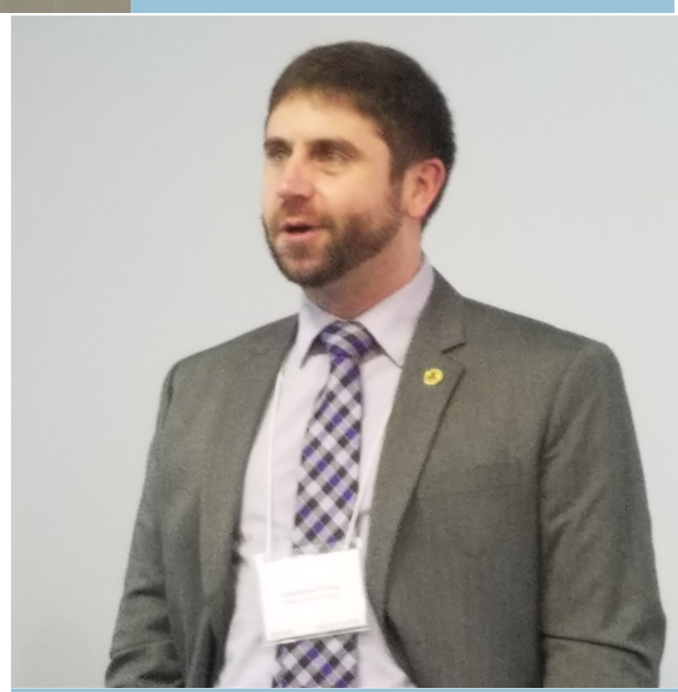
The second speaker, Ali Gokirmak of the University of Connecticut, gave a historical look at digital storage of information. Understanding the physical phenomena in semiconductors from a physics and engineering level was elaborated in scenarios such as Flash memory and dynamic materials was explored and made accessible for the audience. This overlap between physics at the interface of industry in this field is symbiotic to the theme of the Fall meeting. Lastly, The keynote lecture was delivered by Rudolph Tromp from IBM during a wonderful desert, showcasing the various career paths available to physicists. Since the APS-NES meeting draws students at many levels, this talk was both informative and illuminating as to the endless possibilities a physics education provides.

Ali Gokirmak giving invited talk on "Phase Change and Thermoelectricity"

Recap of the Fall 2017 APS-NES meeting at URI

The Keynote Speaker, Rudolph Tromp (left), giving his talk on "So you have a degree in physics, now what?"

Joseph Woicik, giving invited talk on "Physics, Industry and electronic materials at NIST beamlines"



Benjamin Young, giving invited talk on "Li-Ion Battery Advancement with hard X-ray Photoelectron Spectroscopy"

Recap of the Fall 2017 APS-NES meeting at URI, contributed talks

Nancy Burnham, WPI, presenting contributed talk "*Nanophysics for improving industrial oil extraction"*

Nimesh Skukla, Wesleyan University , presenting contributed talk "*Sucralose Interaction with Protein Structures"*

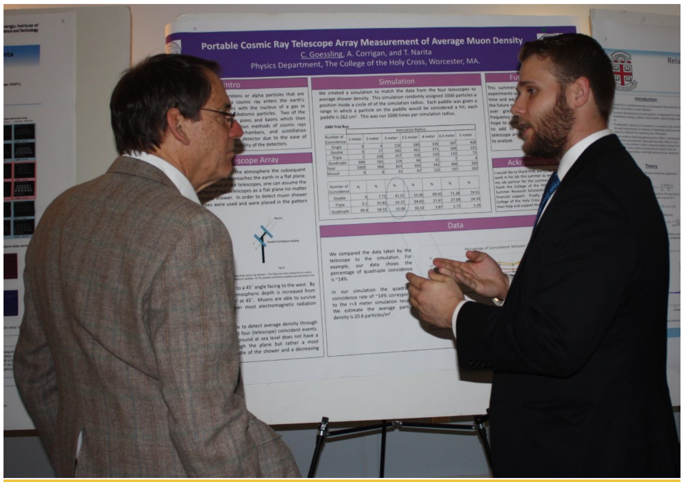
Samana Shrestha (left) and Adam Vanasse (right), URI, presenting contributed talk "*Gene expression as a bio indicator for radiation exposure in Drosophilia Melanogaster"*

David Browning, of Browning Biotech, presenting contributed talk "*Global Warming impact on low frequency sound transmission in the ocean—Jurassic acoustics here we come"*

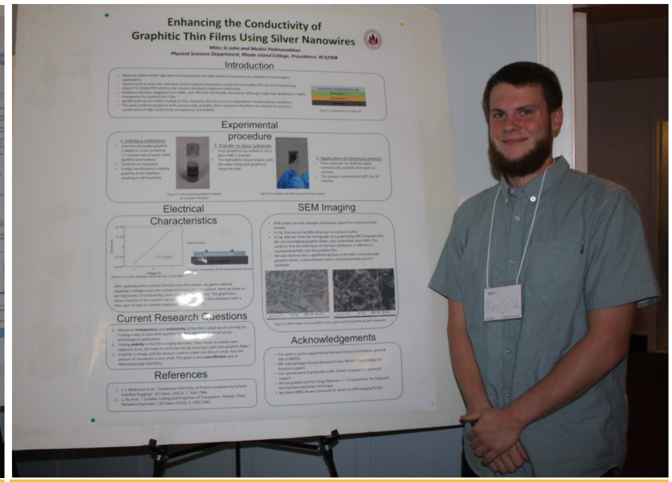
Wenyu Bai, Brown University, presenting contributed talk "*Sensitive photoacoustic trace gas detection with a moving optical grating"*

James Phillips, Illinois Inst. of Tech, giving contributed talk " *Sub-picometer Laser Distance Gauge for Gravitational and Astronomical Instruments"*

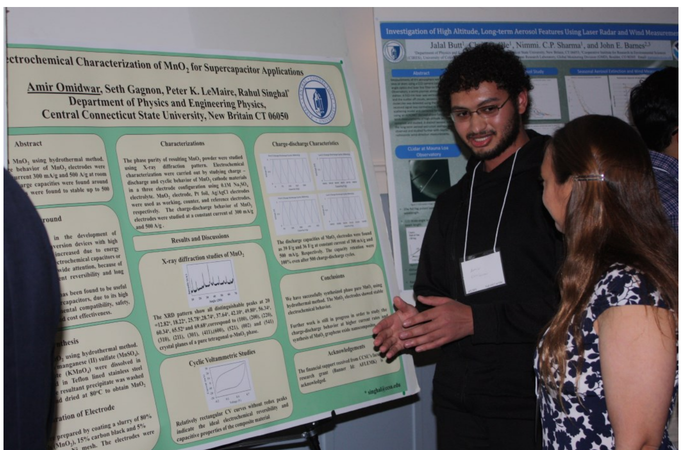
Recap of the Fall 2017 APS-NES meeting at URI, posters



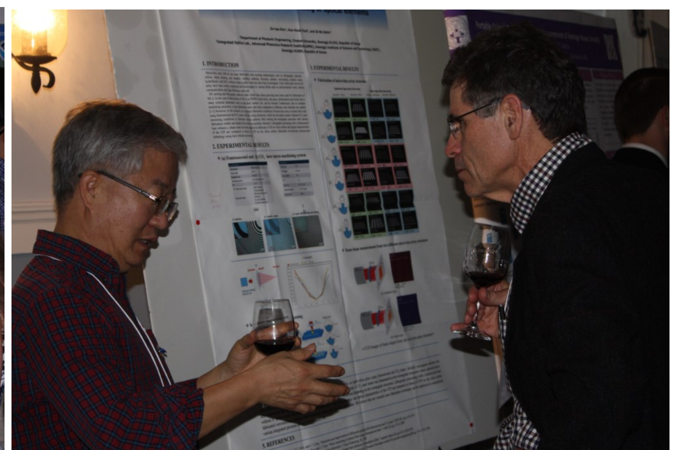
C. Goessling (right), College of the Holy Cross, presenting poster on "*Cosmic Ray Telescope Array Measurement of Average Muon Density*"



Miles St. John, Rhode Island College, presenting poster on "*Enhancing the conductivity of graphitic thin films using silver nano wires*"



Amir Omidwar (left), Central Connecticut State Univ., presenting poster on "*Electrochemical Characterization of* MnO_2 *for Supercapacitor Applications*"



Jin-Tae Kim (left), Chosun Univ., Republic of Korea, presenting poster on "*Femtosecond micromachining of optical elements*"

Amanda Prescott (left), Univ. of Massachusetts—Dartmouth, presenting poster on "*Vertical Axis Wind Turbine Induction Generator Subsystem*"

Michael Narijauskas (left), Central Connecticut State Univ. and Nuclear Data Evaluation Group at TUNL Collaboration, presenting poster on "*Nuclear Data Evaluation at TUNL*"

Recap of the Fall 2017 APS-NES meeting at URI, banquet






Do you have interesting Physics related articles, new programs, research report, physics talking points etc. that you will like to share with the New England Physics Community?
Send them to
James O'Brien (obrienj10@wit.edu)

Recap of the Fall 2017 APS-NES meeting at URI, Modern dance

SYREN Modern Dance at APS New England Section Meeting

SYREN felt quite honored to perform at the APS meeting in October at University of Rhode Island. Our company was warmly welcomed and very much enjoyed the exchange, although I was anxious, to be sure! A choreographer interested in quantum mechanics and creating a dance about that area of science, then sharing that creation for the first time to a roomful of professionals in that field, might be legitimately compared to a physics professor giving a lecture using creative movement. Either scenario has great potential, but let's be honest, it's hit or miss.

As a NYC-based dance company in its 15th Season, SYREN has explored a myriad of different subjects in our work. One of a choreographer's greatest gifts is to work with a company of dancers that trusts him/her implicitly. I've created dances that have been based on the history of the Sephardic Jewish Community, ("Abravanel"); the cycles of human life, ("the last of the leaves"); ancient Egypt, ("Dig"); relationships among women, ("Dolce"); and the definition of beauty and intimacy in our fast-paced, high tech society, ("Wayside Sacrament.") The process is complex and always evolving, thus, SYREN always involves collaboration. Dancers have real input via in-studio assignments and improvisations. The first few rehearsals buzz with the excitement of beginning a new piece, and with new phrase-work, improvisations, and assignments.

I recall that, in 2015, walking into the studio to begin a new work, there was an excitement, being together to begin something new, but the level of trust that I sensed, was not quite the same. It wasn't that the dancers weren't curious, but more that they felt lost. It is one thing to have factual information about ancient Egypt or the cycles of human life. Both are complex topics with plenty to study, yet there is something ascertainable from each. One can recall the mystery of the the pyramids from elementary school, or one can recall their first funeral or meeting their baby sister. Yet when I offered a work on "quantum physics" I was met with blank stares and furrowed eyebrows. Being respectful of me, not a word was said that expressed any hesitation or question. We got to work. In retrospect, those early moments of insecurities might have been better served had I expressed my limited knowledge of physics and that I'd never known what a quark was until I decided to find out. For months, we worked hard, learning new material in the studio and exploring the world of quantum mechanics through movement. They became inspired, perhaps through the passion that emanated from their instructor. I could see potential in the work

Recap of the Fall 2017 APS-NES meeting at URI, Modern dance

starting to emerge.

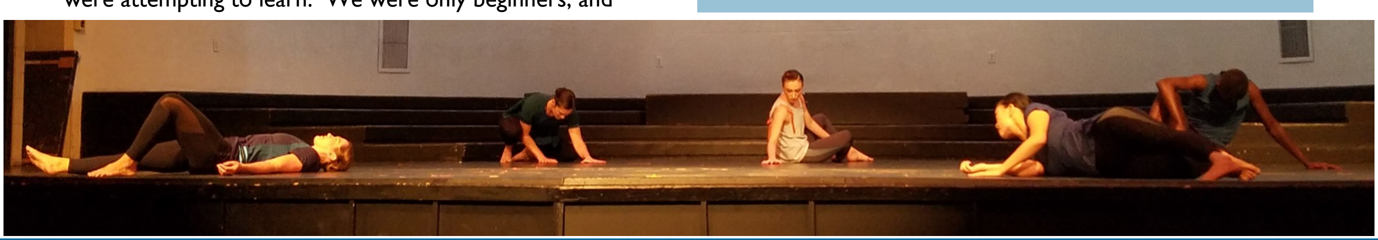
There are many subjects within the field of quantum mechanics that inspire me: Entanglement; Superposition; Duality; Waves; Particles; Uncertainty Principle. Every single thing I'd learned seemed to burst open to expose another layer of movement potential. My appetite was insatiable, and the dancers felt my increasing confidence and certainty about the identity of the work. The piece began to coalesce, evolving into a 30-minute dance, titled "Red and Blue, Bitter and Sweet".

Still, in reality, the company members were very much at a distance about the specifics of the subject matter until we began to perform the work. At times, we would engage the audience in a question and answer session, and, as knowledge was shared and ideas emerged, things began to make sense. It became acceptable to us, as a group, that we couldn't decipher equations or fully comprehend the complexities of quantum mechanics. Oddly enough, due to such limitations, we grew in confidence, not because of what we knew, but because of what we were attempting to learn. We were only beginners, and it felt good. We did not know how to explain something like Uncertainty Principle with any scientific accuracy, but that would not prevent us from exploring it.

What do we embody if we shy away from learning, from science, because it is strange and complicated? The human quest for knowledge is a most precious gift. What Legacy do we leave, if we back away because we feel overwhelmed or that we don't belong? We seek knowledge when we become curious, and as we move forward our confidence grows. For SYREN, this confidence blossoms as we meet new audiences.

The APS conference gave us the opportunity to share our work and it was nerve-racking, and it was wonderful. The response was most memorable. So many probing questions; so much relevant and helpful dialogue; so much genuine interest shared. Here were science and art collaborating at a high level. This conference proved to be both energetic and inspiring. It was an example of what science and art can do for each other, and ultimately, for humanity.

Author: Kate St. Amand



Investigation of High Altitude, Long-term Aerosol Features Using Laser Radar and Wind Measurements

Jalal Butt, Chris Oville, Nimmi C.P. Sharma, and John E. Barnes

Introduction

The principal interest of the study of aerosols in Earth's atmosphere is the effect that these tiny suspended particles have on air quality, weather patterns, and long-term climate trends. Aerosols are a broad category of substances which include both anthropogenic sources - such as soot and pollution from industry – and natural sources – such as mineral dust and volcanic ash. Aerosols have a complex role in influencing radiation balance and processes such as cloud formation which requires an increased understanding of the aerosols, their distributions and their properties.

Ground-based Laser Radar, or Lidar, is a remote sensing technique that is widely used to detect aerosols because of its ability to accurately measure range and light scattered from the aerosols. A Lidar system has two main components: a laser which is typically emitted vertically and a detector that measures the scattering which results from the laser's interaction with the atmosphere. Modeled molecular scattering is subtracted from the total scattering, and extinction – a measure of the attenuation of laser light due to scattering (with assumed absorption) is calculated. This study used a novel CCD camera-based bi-static Lidar, or CLidar, to detect aerosols at Mauna Loa Observatory on the island of Hawaii.

Mauna Loa Observatory is a world-premiere atmospheric research station which, because of its altitude, remote location, and compliment of equipment, serves as a baseline location for equipment testing and calibration. Due to the CLidar's excellent altitude resolution close to the ground, it was an ideal choice for the study of baseline aerosol levels in the lowest atmospheric layer, the troposphere.

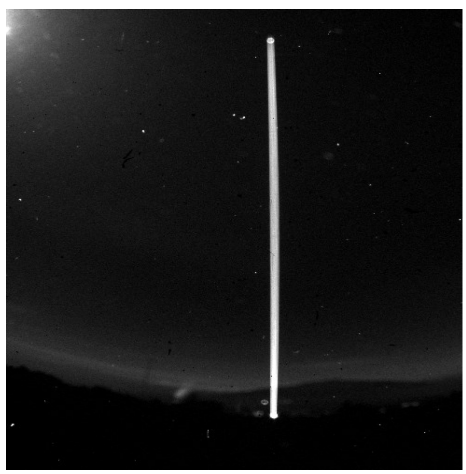
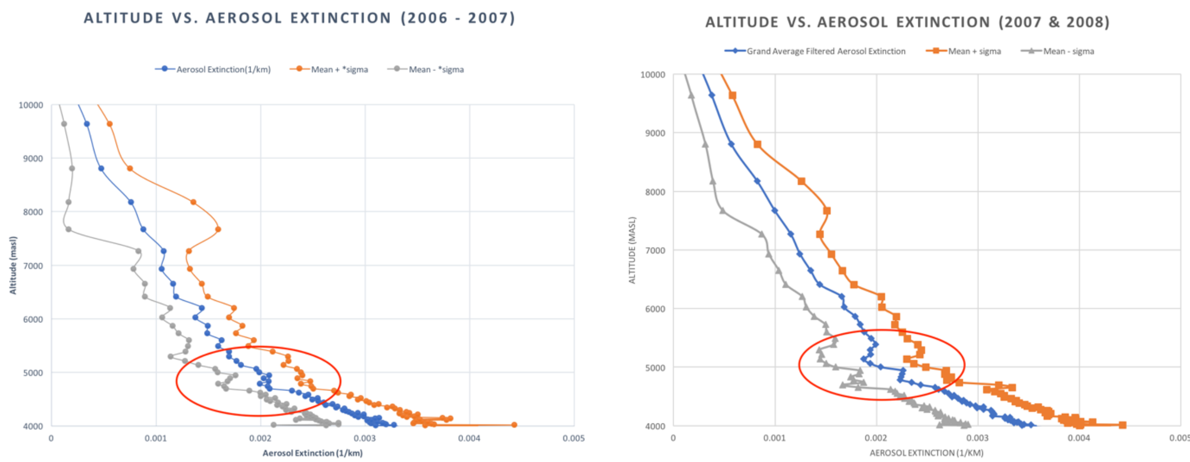


Figure 1: CCD camera image of the 20-Watt beam at MLO

Baseline Tropospheric Air Study and Persistent Aerosol Feature

Aerosol extinction was calculated for all available CLidar data from Mauna Loa Observatory (MLO) in the eight seasons comprising 2007 and 2008 (including November – December 2006). Aerosol extinction was calculated using side-scatter signal detected by the CCD camera by normalizing beam side-scatter in an aerosol free region to a molecular scattering model and by correcting for beam transmission using an aerosol phase function derived from AERONET photometer measurements at MLO. Two tropospheric aerosol baselines were constructed by compiling the calculated aerosol extinctions at MLO for each respective year. The baseline tropospheric aerosol extinction profiles are imaged in figures 2 and 3.

Recap of Spring 2017 Meeting…



Figures 2-3: 2006-2007 and 2007-2008 baseline aerosol extinction profiles (blue) in the troposphere with standard deviation (grey and orange).

A distinct aerosol feature in the 4700-6200-masl range was observed in the long-term tropospheric aerosol baseline, highlighted in figures 2 and 3. The aerosol feature observed in the long-term baseline was further examined through the analysis of individual CLidar aerosol profiles to study the aerosol feature's existence and behavior over relatively short time-periods. The vast majority of these individual profiles noticeably hosted the aerosol feature, though some were found to show the feature prominently. Two individual aerosol extinction profiles from 2007 are overlaid by each other and plotted in figure 4.

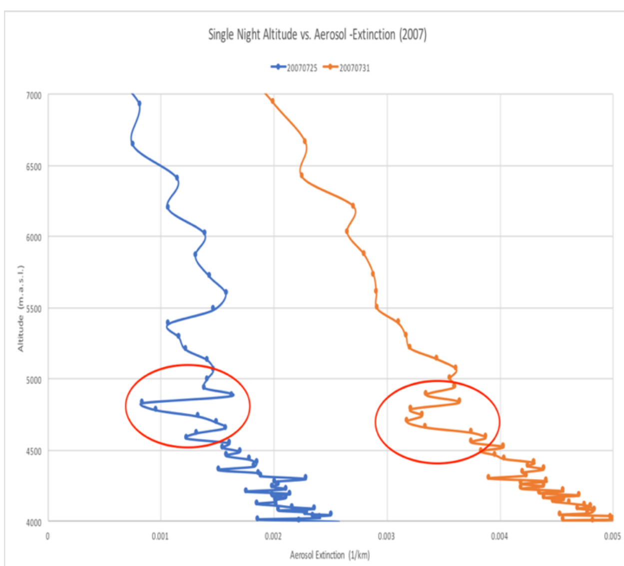


Figure 4: Average aerosol extinctions from 20070725 (blue) and 20070731 (orange), highlighting the aerosol feature.

The aerosol feature appears prominently in both aerosol extinction profiles plotted in figure 4. An important question regarding the long and short term dynamics of the aerosol feature inquires the origins of the air above and below the aerosol feature. NOAA's Hybrid Single Particle Lagrangian Integrated Trajectory (HYSPLIT) model, a system that computes simple air parcel trajectories as well as complex transport, was used to study the air above, immediately below, and below the aerosol feature observed in 20070731. The air parcel back-trajectory result from the HYSPLIT model is shown in figure 5.

Recap of Spring 2017 Meeting…

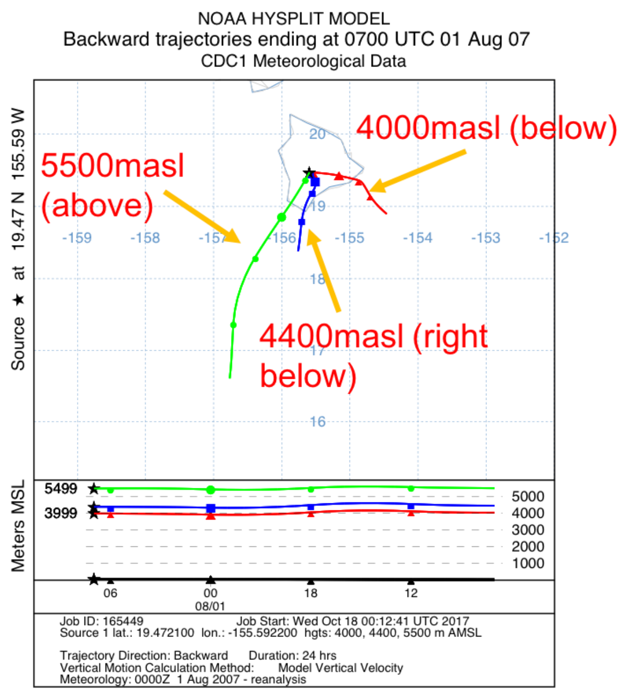
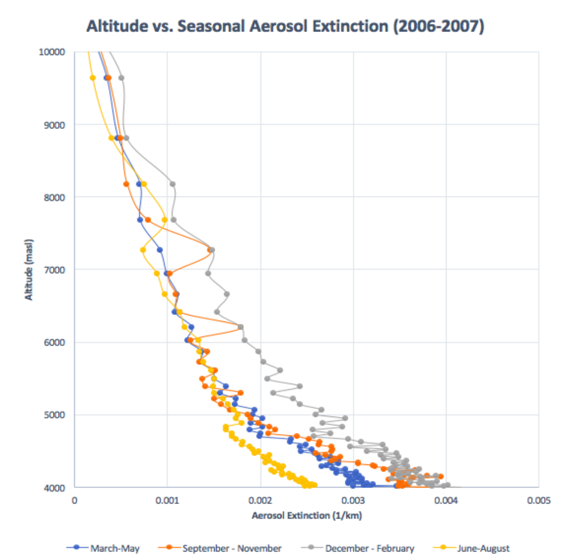


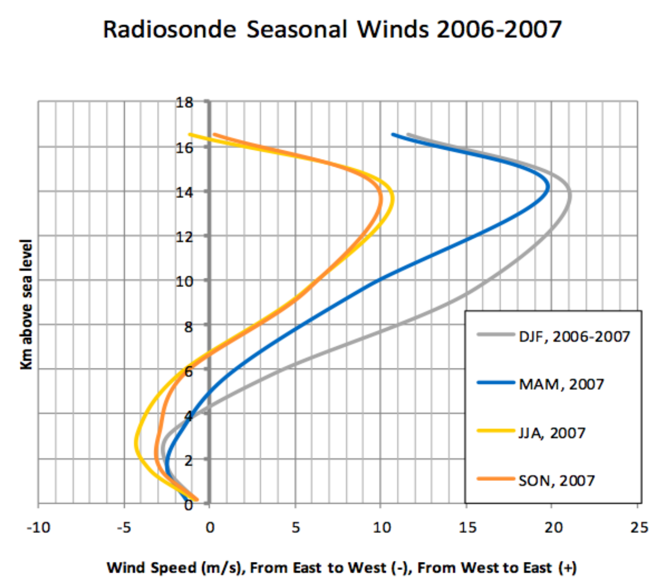
Figure 5: Air from above, right below, and below the aerosol feature highlighted in 20070731 *(NOAA HYSPLIT model)*

The HYSPLIT model back-trajectory results indicate that air parcels above the aerosol feature were found to originate from the west while air parcels below the feature originate from the east. The back-trajectory result for this individual data set suggests that the aerosol feature on 20070731 lies at the interface of cross-winds.

Seasonal Aerosol Extinction and Wind Measurements at MLO

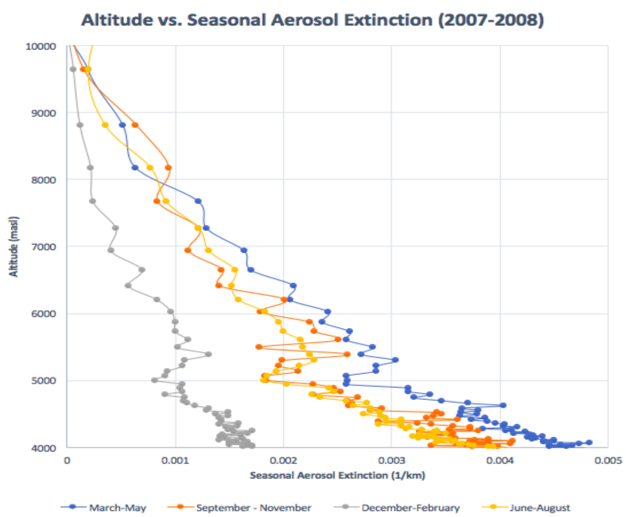
Now, we are interested in whether the air parcel origin result of the aerosol feature in the short-term is general enough to be extended to the long-term. Seasonal baseline aerosol extinction profiles and the respective seasonal radiosonde wind profiles were compiled and studied for 2007 and 2008; these data are shown in figures 6-9.

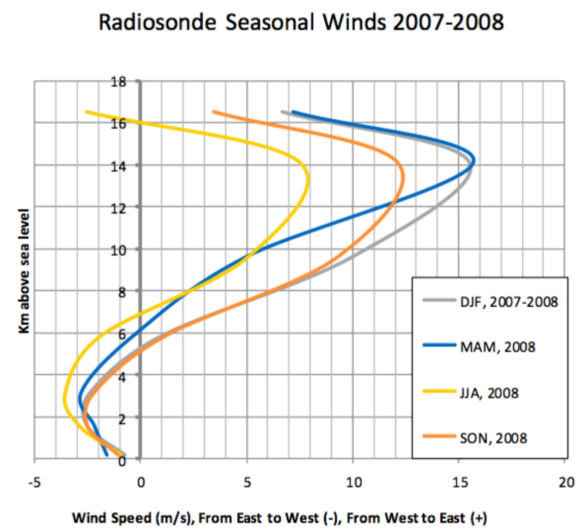




Figures 6-7: 2007 baseline aerosol extinction and radiosonde wind direction data for the respective seasons.

Recap of Spring 2017 Meeting…

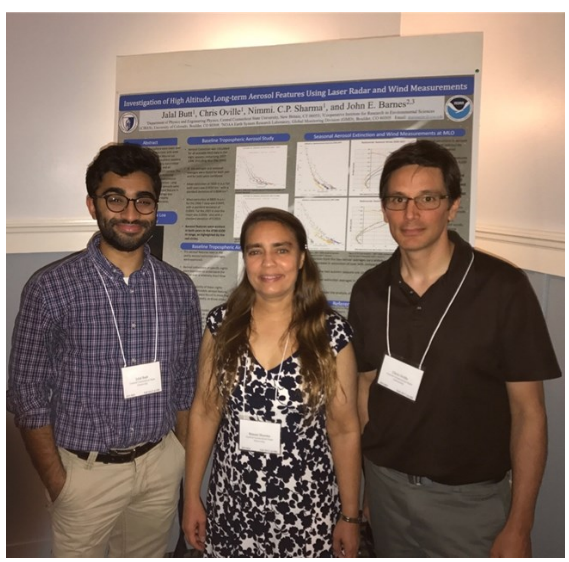




Figures 8-9: 2008 baseline aerosol extinction and radiosonde wind direction data for the respective seasons.

Radiosonde data was experimentally obtained by launching instruments attached to balloons from Hilo, HI at nearly the same time the CLidar was operated. Hilo, HI is approximately 60-km from MLO. Radiosonde data are separated into seasons (December January February, DJF; March April May, MAM; June July August, JJA; and September October November, SON). All seasons and years of the radiosonde data showed an altitude range there the winds direction transitioned from east-to-west to west-to-east. Figures 6-9 show that the aerosol feature in each season of 2007 and 2008 is located at an altitude range in which the seasonal wind profile correspondingly shows a transition from east-to-west to west-to-east. wind-direction shifts.

Conclusion
Long-term lidar measurements of atmospheric aerosols were used to construct tropospheric baseline aerosol profiles for the years of 2007 and 2008. Both tropospheric baseline aerosol profiles showed a distinct aerosol feature in the 4700-6200-masl altitude range, which were then further studied. Results showed that the aerosol feature was persistent in both short and long term lidar atmospheric measurements and that the feature existed at an interfacial region at which wind directions shifted from east-to-west to west-to-east. The transition in wind directions suggests potential differences in aerosol dynamics and aerosol-source regions between the different winds, which possibly influence aerosol loading.



Authors (Left to right): Jalal Butt, Nimmi Sharma, and Chris Oville, Central Connecticut State University.
Not in picture: John Barnes, National Oceanic & Atmospheric Admin., Mona Loa Observatory, Hawaii.

The 2017 Nobel Prize in Physics

Over the course of the few years, the world of Physics has been alive with news of groundbreaking discoveries. Many of these recent advances have been crucial to the confirmation of results that are at the cornerstone of modern physics. These triumphs are a culmination of the efforts of theorists and experimentalists alike. The spoils of recent physics, has in many cases been a testament to the patience and persistence of science. For example, in 2013, after being postulated over fifty years ago by Peter Higgs and company, the Higgs Boson was detected at the Large Hadron Collider (LHC). In 2008, Gravity Probe B returned to Earth with results to further verify the geodetic curvature effect of Einstein, as well as provide a first measurement of the mind blowing gravitational frame dragging effect. In 2017, the world of physics finds itself once again celebrating victory, with the first detection of Gravitational Waves at the Laser Interferometer Gravitational-Wave Observatory, LIGO. Not surprisingly, the Nobel Prize in Physics for 2017 was granted to the LIGO collaboration, specifically to Rainer Weiss, Barry Barish and Kip Thorne for "their decisive contributions to the LIGO detectors and the observation of gravitational waves."

The LIGO (Laser Interferometer Gravitational-Wave Observatory) collaboration was originally founded in the mid 1960's as an idea to use interferometry to attempt to measure Gravitational Waves. In those early days was when two of the winners of the prize, Rainer Weiss and Kip Thorne first approached the problem. Rainer Weiss initiated the first prototype construction using military funding in 1967, while Kip Thorne began laying the theoretical framework just one year later. These two began an incredible journey and remained part of the team and founded a large-scale collaboration in the 1980's between MIT, Caltech and NSF. The journey ahead through the 1980's and 1990's was paved with difficulty as the team was pushing the limits of experimental bounds. The turning point came in 1994 when Barry Barish (the third winner of the prize) was named director of LIGO. In 2002, LIGO began taking data and did so for the better part of a decade. The collaboration in totality houses over a thousand scientists and collaborators and makes use of peer to peer data processing by over four hundred thousand home users. The initial signal was detected in December 2015 at both LIGO facilities, with a an announcement in December 2016 which became the famed signal **GW151226.** Since then, LIGO has successfully made a total of 6 detections of gravitational waves.

The future of LIGO is now wide open as the facility will be expanding to LIGO India as well as making some well-deserved upgrades. For the community of science, significant discoveries which show the validity of core concepts predicted by powerful theories are confirmation in the physics which comes from their predictions. In the case of LIGO, 100 years passed since the prediction of gravitational radiation and through some amazing challenges, scientists once again have pushed the theoretical and experimental bounds of the human mind. We here in the APS-NES chapter wish a warm and well-deserved congratulations to Dr. Weiss, Dr. Barish and Dr. Thorne for their amazing hard work and perseverance. This story of triumph creates new opportunities for the future of science, and we welcome what new discoveries will be had in 2018.

Author
James O'Brien, WIT

APS-NES Undergraduate Research Spotlight!

For years, the APS-NES chapter has been a strong supporter of undergraduate research and its importance in today's physics education. Evidence of this can be seen by the strong attendance record at APS-NES meetings by undergraduate students, as well as the increasing number of poster and oral presentations by undergraduate student collaborations. However, for many of these students, a first poster or presentation presents new challenges that are not typically encountered in the classroom but provides practice for future careers in science. Typically, a first poster is a predecessor to a first paper and in some instances, first exposure to a peer review process. Unfortunately, though in many cases, a poster is a terminal event and sometimes gets forgotten. To this end, the APS-NES newsletter will be providing a new future featuring a spotlight on undergraduate research projects presented at APS-NES meetings. These highlight articles will be short and concise yet provide the writers a chance to tell a full story in a professionally written form. Light peer reviewed feedback will be provided and the best of these will be featured in upcoming issues of our newsletter. Please help us in spreading the word to your undergraduate students. Any discipline or sub-discipline of physics will be accepted. We hope that with your support, this can be a niche avenue for APS-NES students to gather some new experience as well as provide a centralized location for highlighting exceptional work. The first article featured in this Newsletter received the most votes of approval from the Fall 2017 meeting. The article features undergraduate students Jalal Butt and Chris Orville and was work performed at Central Connecticut State University under the guidance of Dr. Nimmi Sharma. Please take the time to enjoy our first APS-NES undergraduate research spotlight, featured on page 9.

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at
www.aps.org

About the University of Rhode Island

The University of Rhode Island has the intimate feel of a smaller university, but our thinking and our research, innovations, and cross-discipline collaboration is very big. At URI, you'll find some of today's leading innovators, discoverers, and creative problem solvers offering a constant flow of big ideas to address global needs. For more than 125 years since our founding, the University's traditions of active student participation, community, and innovation have set us apart.

More than 16,000 undergraduate and graduate students work side by side with more than 720 full-time, tenure-track teaching faculty, as well as with hundreds of dedicated lecturers, researchers, and adjunct faculty. We're proud to be an increasingly international community, with students from all over the nation and world. The University has 122,595 alumni now living around the world.

Faculty are the heart of any institution of higher learning, and that is particularly true at the University of Rhode Island. We are proud of the distinguished scholars and researchers who make up our faculty and of the excellence and commitment to their students they demonstrate in the classroom, laboratory, and in their role as mentors and advisors.

Our graduates are powerful and inspirational reminders of the most important outcome of the University's work: The education of people who are prepared and empowered to pursue their hopes and aspirations, and to do so with respect, understanding, and appreciation for others.

Our Mission

The University of Rhode Island is the State's public learner-centered research university. We are a community joined in a common quest for knowledge. The University is committed to enriching the lives of its students through its land, sea, and urban grant traditions. URI is the only public institution in Rhode Island offering undergraduate, graduate, and profes-

...About URI

sional students the distinctive educational opportunities of a major research university. Our undergraduate, graduate, and professional education, research, and outreach serve Rhode Island and beyond. Students, faculty, staff, and alumni are united in one common purpose: to learn and lead together. Embracing Rhode Island 's heritage of independent thought, we value:

- Creativity and Scholarship
- Diversity, Fairness, and Respect
- Engaged Learning and Civic Involvement
- Intellectual and Ethical Leadership

Investing in Our Future

In the last 10 years, about $400 million has been invested in renovating or constructing nearly 1 million square feet of space at the university's four campuses to educate, house and support our students and provide cutting-edge facilities to advance science, innovation, and research. Capital improvements have been made possible in large part through bond referenda support by voters in Rhode Island. Newest among these investments is a $68 million Beaupre Center for Chemical and Forensic Sciences, located in the Science District of the Kingston campus, near the center for Biotechnology and life sciences and the new Paramaz Avedisian '54 Hall for the College of Pharmacy.

Physics at URI

In the Department of Physics at the University of Rhode Island, our community of scientists wants to know more about how the universe works and never stop asking questions. Here our students can build their foundation in physics, engage in innovative research, create an exciting career and discover their own questions.

Our B.S. programs offer students real choices. The B.S. in Physics provides a solid background in theoretical and experimental physics in preparation for graduate study or a career as an industry or government physicist. The B.S. in Physics and Physical Oceanography offers a range of career opportunities in physics and physical oceanography and those who go on to advanced degrees are in high demand.

The M.S. in Physics with both thesis and non-thesis options and the Ph.D. in Physics offer flexibility in course selection, which allows for highly individualized programs of study. Thesis research can be carried out in any area in which a student and a faculty member find a common interest. The bulk of present research efforts at the doctoral level are centered in the broad area of condensed matter physics.

Our accredited, **Medical Physics** program – one of two in New England -- holds two options in which students are introduced to research and clinical aspects of modern medical physics through the Rhode Island Hospital state-of-the-art medical physics therapy and imaging facilities.

5-year B.S. in Physics and M.S. in Medical Physics. This program provides students with rigorous training in essential undergraduate physics courses and graduate physics and medical physics courses.

2-year M.S. in Medical Physics Program. This program is designed for students with B.S. in Physics or related discipline and provides students with rigorous training in graduate physics and medical physics courses.

Quick Facts

- 50 undergraduate majors
- 18 graduate students
- 12 full-time faculty

Undergraduate degree programs

- B.S. in Physics
- B.S. in Physics and Physical Oceanography

Graduate Degree Programs

- M.S. in Physics and Ph.D. in Physics

Special Degree Programs

- B.S./M.S. in Medical Physics (5-year)

URI Physics applied for health

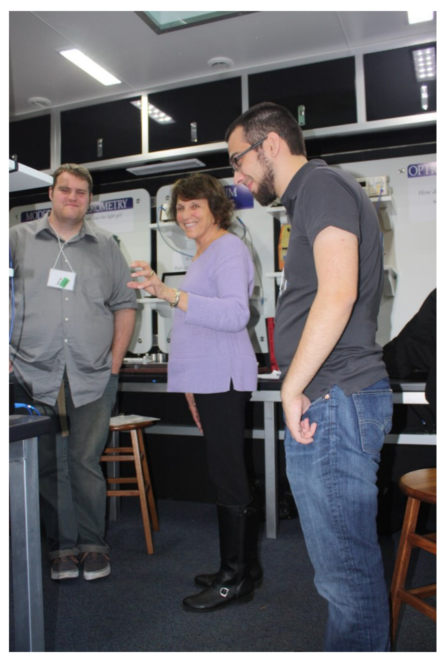
What exactly is medical physics and, just as important, why pursue the field? The short answer is that medical physics is the application of physics concepts to medicine. The profession is booming as health care technology becomes more complex, requiring highly skilled scientists. Medical physicists work in medical imaging, radiation therapy and nuclear medicine, often treating people with cancer and heart disease. They help devise care plans for patients and ensure that medical imaging equipment is working properly.

Launched in 2011, the URI program won accreditation from the Commission on Accreditation of Medical Physics Education Programs in 2014, becoming one of only two accredited medical physics programs in New England.

High school students looking at colleges take note: Students who enjoy science and math and want to apply their talents to the medical field have an opportunity to go from high school seniors to a residency in medical physics in only five years. URI's program offers a unique blend of theory and practice, giving students a tremendous opportunity to succeed in this demanding profession.

Submitted by
Michael Antosh, URI

“Food Truck For the Physics Mind” at the Fall 2017 APS-NES meeting at URI



Meeting pictures courtesy of Peter LeMaire