Welcome to the first of what I hope to be semi-annual newsletters of the Cooperative Institute of Mesoscale Meteorological Studies, also known as CIMMS. I have now served as director of CIMMS for nearly one year, and I remain excited not only about our many ongoing activities, but also about the new activities we have planned. One thing I would like to do is to make sure we maintain an open communication with our many stakeholders and friends so all are informed about CIMMS activities. This newsletter is just one component of this process. An updated and revamped website providing profiles of all CIMMS staff members, posts on Facebook, a presence on Twitter, and participation in many workshops and events are all part of this process. I hope you enjoy hearing about our activities.

As many of you know, CIMMS was established in 1978 and is the largest and second-oldest research center at the University of Oklahoma. This year is CIMMS' 40th anniversary. Watch cimms.ou.edu for more details.

NOAA Hazardous Weather Testbed Begins With HS-PHI Experiment

The NOAA Hazardous Weather Testbed was once again busy buzzing with activity as researchers kicked off the year’s first research activities this spring. Located in the National Weather Center in Norman, Oklahoma, the testbed is operated by the NOAA National Severe Storms Laboratory and the NOAA National Weather Service, with partners and experiment leads from the University of Oklahoma Cooperative Institute for Mesoscale Meteorological Studies. Participants assessed a new tool using rapid-updating, high-resolution Probabilistic Hazard Information, known as PHI.

*CIMMS story continued on page 2

CIMMS Participates in Annual Spring Forecasting Experiment

Many Cooperative Institute for Mesoscale Meteorological Studies researchers were seen within NOAA’s Hazardous Weather Testbed Experimental Forecast Program. The experiment focused on using cutting-edge computer models to improve predictions of hazardous weather from one hour to several hours to several days in advance.

The aim of such an experiment is to support more accurate severe weather warnings and forecasts. Researchers and forecasters worked together to examine and evaluate a variety of model output daily in the HWT, exploring a variety of different models and forecast guidance.

*CIMMS SFE story continued on page 4
analysis, severe storms, atmospheric electricity, boundary layer studies and cloud microphysics. We also are placing an increasing emphasis on social sciences, such as examining the socioeconomic impact of severe weather. In the coming year, we will be holding three workshops aimed at forging new initiatives in collaboration with our many partners in the National Weather Center so that we can further extend the activities of CIMMS to look at more components of high-impact weather. In particular, we are planning workshops titled "Uncertainty in radar retrievals, model parameterizations, assimilated data and in-situ observations: implications for predictability of weather," “Landfalling tropical cyclones: impacts, predictability and forecasting,” and “Arctic weather: forecasts, processes and impacts.” Look for announcements and information about the outcome of these workshops in future newsletters.

There are other new initiatives in CIMMS that I am very excited about. We have established the Peter Lamb Postdoctoral Fellowship. I am pleased to announce that Cassandra Shivers-Williams is our first winner on the basis of her stellar proposal, and she will be working with Kim Klockow McClain. Shivers-Williams, work will contribute to our societal impact group by examining public perceptions and usage of different types of prototypical probabilistic information. In addition, we are completing a reorganization of CIMMS to reflect the fact that we now have more than 190 staff members and $19.1 million of research funding. CIMMS staff members will be organized into different teams, with a number of leaders reporting directly to me, Associate Director Randy Peppler, Assistant Director Sebastian Torres or Executive Director of Finance and Operations Tracy Reinko. I think this will ensure a more efficient interchange of information within our organization. The next step in our reorganization will be the establishment of an effective mentorship program, on which updates will be provided in the next newsletter.

CIMMS newsletters will have some repeating features: profiles of selected staff members and students working in CIMMS, profiles and updates on our CIMMS alumni, descriptions of our research projects, information on upcoming events and lectures, and a recap of recent CIMMS awards, and outreach activities. We welcome ideas for additional features you would like to see in these newsletters. In the current issue we profile staff members Ami Arthur and Alexander Ryzhkov, as well as on alumnus John Cortinas. We highlight CIMMS participation and CIMMS involvement in NOAA’s Hazardous Weather Testbed.

In summary, I am happy to make renewed connections with our staff members, alumni, collaborators and friends and to share the excitement of all the activities we have ongoing at CIMMS. And, I welcome fruitful collaborations for years to come. We welcome updates from you all and will have an Alumni Corner section in future issues: if you are a former member of CIMMS, please take a few minutes to email us and update us on your activities.
- Greg McFarquhar, Director CIMMS
Q&A with Ami Arthur

Ami Arthur has worked at CIMMS for 20 years. She is a research associate supporting NOAA's National Severe Storms Laboratory. In 2015, Arthur was part of the team NOAA recognized for work done on the Multi-Radar Multi-Sensor program, awarding the team a NOAA Silver Medal for engineering science achievement.

Q: What are you most proud of during your time at CIMMS or what is the most significant achievement of your career?
A: During the early 2000s, I led a small team to produce the GIS data sets necessary for the Flash Flood Monitoring and Prediction system that was being implemented at every National Weather Service Weather Forecast Office in the nation. Our team delineated flash-flood-scale drainage basins from digital elevation data for all of the United States and its territories. FFMP was a major advancement in flash-flood forecasting tools at that time. FFMP is still used today in many WFOs throughout the nation.

Q: What is it about your job that interests and/or engages you?
A: Because I am essentially in a support role, I have had the honor over my 20-plus years at CIMMS of assisting in varying degrees with many projects. I have truly enjoyed the opportunity to work with so many different groups and people.

Q: What is the most memorable experience of your career?
A: One of the most memorable times of my career was a two-year period when I was part of a team of instructors for a COMET class at the University Corporation for Atmospheric Research in Boulder, Colorado. The week-long “FFMP Basin Customization” course was offered about a dozen times, and was intended for NWS forecasters. We taught GIS basics, explained how the FFMP basin data set was developed, and provided hands-on training on how to customize the data set for local WFO use. The team of instructors and everyone else who made the classes possible were outstanding to work with and I truly enjoyed meeting forecasters from every WFO. I had the pleasure of continuing to work with many of them over the years as the FFMP data set went through several updates in past years.

Q: What is something you never expected in your field of research, career or CIMMS but it happened?
A: I never expected the opportunities for travel that have come along as part of the projects I have worked on at CIMMS over the years. My most memorable trips were to Taiwan in early 2000 and 2015 for projects our group had with the Central Weather Bureau. During the 2015 trip, my husband, dad, daughter, and son decided to travel with me, and they enjoyed the beautiful sights, while I worked! We all fell in love with the culture, and of course the warmth of the Taiwanese people. What a tremendous experience!

*To read more about Ami Arthur, visit cimms.ou.edu.*

Ami Arthur, far left, during the 2014 NOAA Hazardous Weather Testbed Hydrometeorology experiment. (Photo provided.)
Forecast and research meteorologists create experimental forecasts, interact with new technologies, provide feedback, and decipher the best use of tools in simulated real-time forecasting environments. CIMMS researchers who participated in the Experimental Forecast Program included Kent Knopfmeier, Burkely Gallo, Brett Roberts and Makenzie Krocak. In addition, evaluation of output from a prototype Warn-on-Forecast system was conducted by CIMMS researchers Pat Skinner, Jessie Choate, Kim Klockow McClain and Katie Wilson.

Better Tools for Forecasting Dangerous Weather
The experimental forecast models used in the NOAA Hazardous Weather Testbed become more refined each year as technology improves. Ultimately, the NOAA National Weather Service incorporates insights and improvements from the HWT into their operations. One of the tools tested was NSSL’s experimental high-resolution, on-demand and frequently updating ensemble forecast system product called NSSL Experimental Warn-on-Forecast System for ensembles, or NEWS-e.

Each day, researchers focused their attention on the area with the highest risk for severe weather based on the forecast from NOAA’s Storm Prediction Center. NEWS-e operated in that area and frequently assimilated radar and satellite data to provide specific forecasts of when and where severe weather is most likely on a short time scale — up to three hours in advance.

Another tool tested was the High-Resolution Rapid Refresh Ensemble, or HRRRE, a prediction system developed by the Global Systems Division of NOAA’s Earth Systems Research Laboratory. HRRRE brings in a variety of weather data to produce multiple forecasts, each with a slightly different starting point, to generate hourly snapshots of possible hazardous weather. Each forecast outcome includes the degree of certainty or uncertainty of the hazard occurring. HRRRE predictions provide the starting point for NSSL’s NEWS-e as well.

Utilizing both products in NOAA’s HWT allows forecasters to evaluate the ability of such tools to highlight severe weather hazards, including low-level rotation resulting in tornadoes.
Hazard Services – Probabilistic Hazard Information Experiment is testing an experimental concept for delivering information to the public in a way that simulates how National Weather Service forecasters would use it within their software. Lead project investigator is researcher **Greg Stumpf** of CIMMS and NWS.

“PHI will bring the public more specific weather information, but most importantly it will deliver severe weather information hours, rather than minutes before severe weather could become a threat,” said **Alyssa Bates**, CIMMS researcher supporting the NWS Warning Decision Training Division. “That will allow ample time for businesses, outdoor venues, and health care facilities to execute their severe weather preparedness plan.”

This experiment is one of many in which CIMMS is involved under the umbrella of NOAA NSSL’s FACETs, Forecasting a Continuum of Environmental Threats project. FACETs is an initiative aimed at improving the communication of hail, wind, and tornado hazards to save lives and property. Instead of creating a warning area, in the FACETs paradigm forecasters would create probabilistic hazard information “plumes.” New types of severe-weather warnings can be derived from the plumes.

HS-PHI was one of six different experiments taking place in the NOAA HWT this spring. *For more on CIMMS’ collaborations, visit cimms.ou.edu.*

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**Fun Fact:** CIMMS is based in the National Weather Center in Norman, Oklahoma, but has employees in Missouri, Tennessee and Colorado, too!
Q&A with Alexander Ryzhkov

Alexander Ryzhkov is a senior research scientist supporting NOAA’s National Severe Storms Laboratory and a University of Oklahoma School of Meteorology adjunct professor who has worked at CIMMS for more than 20 years. Ryzhkov develops algorithms for operational weather radars and cloud parameter retrieval techniques to improve the performance of Numerical Weather Prediction models. Recently, Ryzhkov was awarded the prestigious honor of being named an American Meteorological Society Fellow, and in 2007 he was awarded an AMS Editor’s Award by the Journal of Applied Meteorology.

Q: How did you get into your field?
A: By a chance. I was trained in the field of mathematical physics and never thought about a professional career in radar meteorology.

Q: Describe the path leading CIMMS.
A: I attended St. Petersburg University in Russia, then worked at the Main Geophysical Observatory in St. Petersburg, National Research Council, NOAA NSSL and then CIMMS.

Q: What are you most proud of during your time at CIMMS or what is the most significant achievement of your career?
A: NOAA NSSL Senior Research Scientist Dusan Zrnic and I are finishing a monograph on weather radar polarimetry, which summarizes our research findings for the last 25 years.

Q: What is it about your job that interests and/or engages you?
A: Radar meteorology is at the crossroads of different disciplines: radar engineering, wave propagation, scattering theory, signal processing, cloud physics, artificial intelligence, hydrology, etc. I am really attracted by the breadth of research and the opportunity to collaborate with the most brilliant scientists around the globe.

Q: What is the most significant advancement in your field during your time at CIMMS?
A: It is the development of the polarimetric weather radar technology from a research idea to its successful implementation in the operational weather radar network in the U.S. and around the world. This is a classic example of research-to-operations.

Q: What advice would you give your younger self? What would you most like to tell your younger self?
A: Set your goals as high as possible, find the best adviser, and try to reach the most intelligent people in their areas of expertise.

CIMMS is hiring! Check our website - cimms.ou.edu/index.php/careers/ - for all current job listings and more information on how to apply!
In the News

- The University of Oklahoma Cooperative Institute for Mesoscale Meteorological Studies citizen science application mPING was featured several times this spring by media outlets highlighting this collaborative project.
  - "Turn your students into citizens scientists with the mPING app" by Laura Guertin with AGU was featured in GeoEd Trek. Posted on March 4, 2018
  - CIMMS Researcher Kim Elmore interviewed with KCAW-Sitka in Alaska regarding mPING and it aired in February.

- To highlight the multiple uses of satellite data, CIMMS Researcher Kristin Calhoun was highlighted by WeatherNation in "Women making history: the GOES-R Series," posted on March 8, 2018. Calhoun was in Florida for the launch of the most recent GOES-R Series Satellite — the GOES-S — and present how and why she looks forward to this addition in the series.

- CIMMS researchers Katie Wilson and Terry Schuur participated in a "Reddit Ask Me Anything," making it OAR's top Facebook post for April.

Upcoming events


- Nov. 15 - CIMMS 40th Anniversary Symposium. More details to follow.
CIMMS Alumni Spotlight

The University of Oklahoma Cooperative Institute for Mesoscale Meteorological Studies has seen and helped hundreds of researchers start their career. This segment will highlight former CIMMS employees, sharing where they are now.

John Cortinas is the director of NOAA’s Office of Weather and Air Quality. Cortinas started as a research scientist with CIMMS in the early 1990s before becoming the assistant director for NOAA Relations at CIMMS. He worked at CIMMS for a little over 10 years. Cortinas left Oklahoma to become the Cooperative Institute program director in Maryland.

Cortinas has been active in the American Meteorological Society and received the Department of Commerce Bronze Medal Award in 2013.

Keep us up-to-date! Change jobs, win an award, want to reach out to other CIMMS alumni? Contact cimms@nwc.ou.edu with a short paragraph.

Donate!

As OU CIMMS celebrates its 40 years of accomplishments, we strive to continue our goals of furthering research by providing staff resources and travel opportunities. We are grateful for your support of CIMMS through the OU Foundation’s CIMMS Development Fund!

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