*Agenda*

# Array of Things[1] User Workshop

29-30 August 2018

Venue: Argonne National Laboratory

***NOTE: Site access requires registration by 8/21***

**——- 29-August ——-**

0900-0930 Welcome and Workshop Goals (C. Catlett, UChicago/ANL)

0930-1045 State of the Array of Things: Instrument and Platform

*Deployment, Example Use Cases, Status (Charlie Catlett, UChicago/ANL)*

*Platform Architecture and Status (Pete Beckman, Northwestern/ANL)*

*1045-1100 Break*

1100-1200 State of the Array of Things: Science and Data

*Preliminary Evaluation of Air Quality Sensors (Mark Potosnak, DePaul)*

*Data Pipeline, Format, and APIs (Vince Forgione, UChicago)*

1200-1300 Lunch Breakouts for In-Depth Status and Futures Discussions

*Waggle Platform and Edge Computing (Pete Beckman, Northwestern/ANL; Raj Sankaran, ANL; Nicola Ferrier, UChicago/ANL)*

*Air Quality Evaluation Strategies (M. Potosnak, DePaul; R. Kotamarthi, ANL)*

1300-1530 Application Lightening Talks

(10-minute talks on use of, or desired use of AoT data and edge computing)

- *AoT Data to Understand Environmental Effects on Behavior (Marc Berman, UChicago)*
- *Neighborhood-Resolution Environmental Data for Aging Studies (Kate Cagney, Uchicago)*
- *AoT Image Processing for Transportation and Environmental Research (Nicola Ferrier, UChicago/ANL)*
- *Integrating Environmental and Socioeconomic Data with Electronic Medical Records and Molecular Phenotypes (David Liebovitz, UChicago)*
- *Partnership for Healthy Cities (Raed Mansour, Chicago Department of Public Health)*
- *Distributed High-Frequency Urban Sensing for Flood Prediction and Impact Assessment (Aaron Packman, Northwestern University)*
- *AoT Data for Urban Microscale Modeling and Developing Heat Mitigation Strategies (Ashish Sharma, Notre Dame University)*
- *Using AoT for Transportation Research (Dan Work, Vanderbilt University)*
- *microWaggle for Hydrology (Vivien Rivera, Northwestern University)*

*1530-1545 Break*

[1] Array of Things (AoT) is an NSF-funded Major Research Instrumentation project with cost-sharing partners including the University of Chicago, the City of Chicago, and multiple industry partners. AoT uses Argonne National Laboratory's open Waggle platform.

1545-1700 Toward a User-Driven Instrument: Round Table Strategy Breakouts

*Breakout leaders will produce a 2-3 page discussion summary with recommendations.*

Science: Instrument Science and Capabilities Roadmap

(Dan Work, Vanderbilt; Pete Beckman; Northwestern/ANL; Kathleen Cagney, UChicago)

*Given state, technology, and trajectories, how can the AoT team maximize scientific value of the instrument? How should it evolve with respect to new sensors, edge computing, etc?*

Data Services Outputs

(Charlie Catlett, UChicago/ANL; Tom Schenk Jr., KPMG (formerly City of Chicago); Vince Forgione, UChicago, Sean Shahkarami, UChicago)

*Review current state, APIs, data formats, long term access strategies, how to provide data to optimally couple with computational models, workflows, science gateways.*

Deploying Cyberinfrastructure in the Public Way

(Kate Kusiak Galvin, UChicago; Danielle DuMerer, City of Chicago; Brenna Berman, CityTech (formerly City of Chicago), Von Welch, Indiana University)

*Overview and analysis of the policies, agreements, processes, public engagement, and interactions necessary for a successful deployment of research infrastructure in the public way. Discussions will include lessons learned in Chicago and several initial partner cities and discussion leaders will walk through the AoT policies, procedures, and agreements.*

—- *Evening reception - Argonne Guest House Patio* —-

**——- 30-August ——-**

0900-0945 Breakout Reports and Discussion
0945-1000 Mini-Workshops Overviews and Move to Breakout Rooms
1000-1230 Mini-Workshops (Session 1)

*1230-1330 Lunch (workshops continue)*
1330 Adjourn

*Mini-Workshops*

A: Analyzing AoT data (data-tools, hands on with spatial analytics, Jupyter notebooks)

Anand Padmanabhan and Haozhi Pan, UIUC CyberInfrastructure and Geospatial Information Laboratory
Marynia Kolak, UChicago Center for Spatial Data Science
Mike Papka, ANL/NIU

*This workshop is intended to introduce participants to a variety of geospatial time series data analysis tools and approaches, both existing and proof-of-concept, to drive a discussion regarding the analytics tools requirements of end-users.*

B: AoT Edge Computing and Machine Learning

Pete Beckman, Northwestern/NIU
Nicola Ferrier, UChicago/ANL
Rajesh Sankaran, ANL

*This workshop is intended to introduce participants to the edge computing capabilities of the Waggle platform, including an overview of the current machine learning environment for computer vision support. The workshop will also solicit input from end-users regarding optimal edge computing tools and logistical support for developers wishing to deploy software on AoT nodes.*

C: "School of Things" ("SofT") High School and Middle School Curriculum

Douglas Pancoast, School of the Art Institute of Chicago
Kate Kusiak Galvin, UChicago

*This workshop will introduce participants to an 8-week high school and middle school curriculum using wireless sensor technologies to engage students in learning and applying Computer Science skills to a broad range of STEM topics. Originally called "Lane of Things" ("LofT"), the team has trained over 400 students in three years, and will expand the curriculum to other Chicago schools in the 2018-2019 school year.*