

# Argonne Training Program on Extreme-Scale Computing (ATPESC)

## INTRODUCTION TO THE ATPESC

Presented to  
**ATPESC 2017 Participants**

**Marta García Martínez**  
ATPESC 2017 Program Director

Q Center, St. Charles, IL (USA)  
Date 07/30/2017



EXASCALE COMPUTING PROJECT



U.S. DEPARTMENT OF  
**ENERGY**

Office of  
Science



# Outline

 **Welcome**

 **A few words about Argonne National Laboratory**

 **Motivation of the ATPESC**

 **The curriculum**

 **Logistics and reminders**

# WELCOME

# Welcome!

## 70 ATPESC 2017 Participants

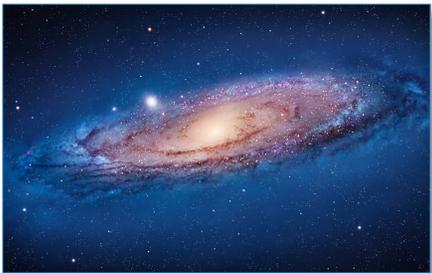
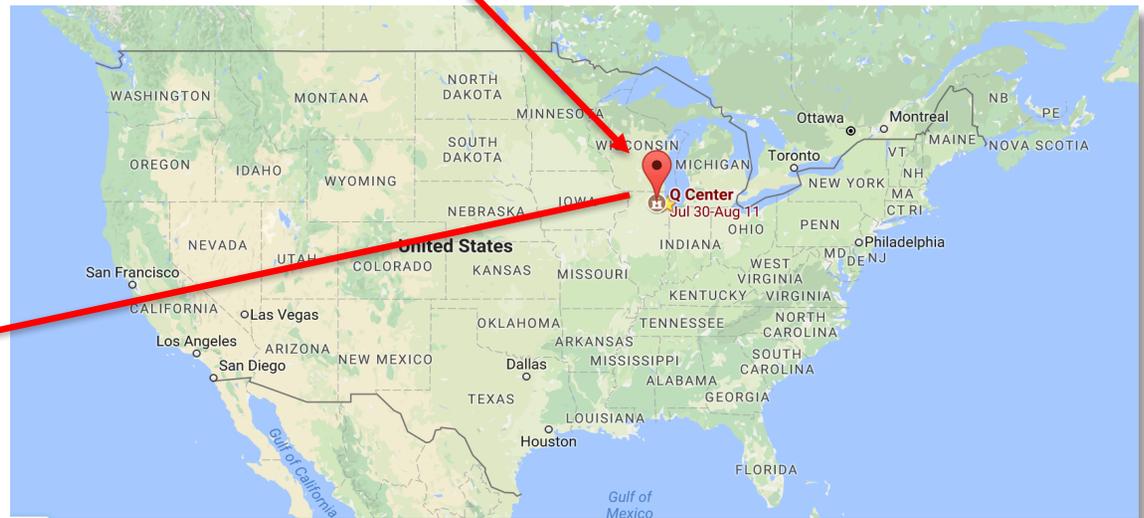
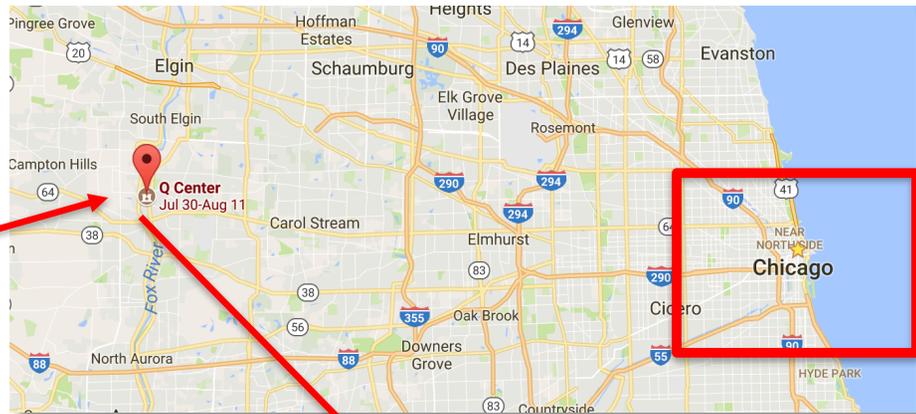
<i>Aditya</i>	<i>Alessandro</i>	<i>Alessio</i>	<i>Alexander</i>	<i>Alexander</i>	<i>Alexey</i>
<i>Amelia</i>	<i>Anand</i>	<i>Ben</i>	<i>Ben</i>	<i>Benjamin</i>	<i>Carlo</i>
<i>Carola</i>	<i>Cheng-Yu</i>	<i>Chris</i>	<i>Christos</i>	<i>Daniel</i>	<i>Eric</i>
<i>Eric</i>	<i>Ferran</i>	<i>Forrest</i>	<i>Forrest</i>	<i>Gabriele</i>	<i>Gaddiel</i>
<i>Gopal</i>	<i>Guillaume</i>	<i>I-Te</i>	<i>Jakub</i>	<i>Johann</i>	<i>Jon</i>
<i>Jonathan</i>	<i>Jonathan</i>	<i>Julien</i>	<i>Justin</i>	<i>Kuo-Chuan</i>	<i>Kurt</i>
<i>Kyle</i>	<i>Lindsay</i>	<i>Lisa</i>	<i>Marc</i>	<i>Matthew</i>	<i>Maxence</i>
<i>Mikhail</i>	<i>Nadish</i>	<i>Nathan</i>	<i>Nicholas</i>	<i>Ozan</i>	<i>Philipp</i>
<i>Polykarpos</i>	<i>Rahulkumar</i>	<i>Richard</i>	<i>Robert</i>	<i>Saumil</i>	<i>Sergi</i>
<i>Sergio</i>	<i>Shikhar</i>	<i>Shinhoo</i>	<i>Sidafa</i>	<i>Som</i>	<i>Sumathi</i>
<i>Sunwoo</i>	<i>Swarnava</i>	<i>Théophile</i>	<i>Thilina</i>	<i>Thomas</i>	<i>Tom</i>
<i>Vishal</i>	<i>Xavier</i>	<i>Yuliana</i>	<i>Zahra</i>		

# Welcome!

## 45 Institutions

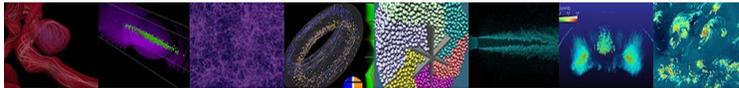
- Argonne National Laboratory
- Cornell University
- Georgia Institute of Technology
- Institute for Computational and Engineering Sciences
- Lawrence Livermore National Laboratory
- Michigan State University
- National Renewable Energy Laboratory
- Northwestern University
- Princeton Plasma Physics Laboratory
- Sandia National Laboratories
- Technische Universität Wien
- University of California, Irvine
- University of Florida
- University of Michigan
- University of Virginia
- Brown University
- CTTC - Heat and Mass Transfer Technological Center
- IBM Research
- KTH Royal Institute of Technology
- Los Alamos National Laboratory
- NASA Langley Research Center
- NOAA / Engility
- Oak Ridge National Laboratory
- Princeton University
- Stanford University
- The University of Texas at Austin
- University of California, Los Angeles
- University of Illinois at Urbana-Champaign
- University of Pittsburgh
- University of Wisconsin-Madison
- California Institute of Technology
- Geophysical Fluid Dynamics Laboratory
- INRIA
- Lawrence Berkeley National Laboratory
- Massachusetts Institute of Technology
- National Center for Atmospheric Research
- North Carolina State University
- Old Dominion University
- Purdue University
- Technical University of Ostrava
- University of California, Berkeley
- University of Colorado Boulder
- University of Massachusetts Dartmouth
- University of Southern California
- University of Wyoming

# You are here: **Space ...**



# You are here: Time...

 Argonne Training Program on Extreme-Scale Computing



ATPESC  
2018

ATPESC  
2019

...



## ATPESC 2017

- Two-weeks training program
- Once-in-a-lifetime experience
- Conceived as a retreat

# A few words about Argonne National Laboratory

# Argonne – a part of DOE National Laboratory System

## Office of Science Laboratories

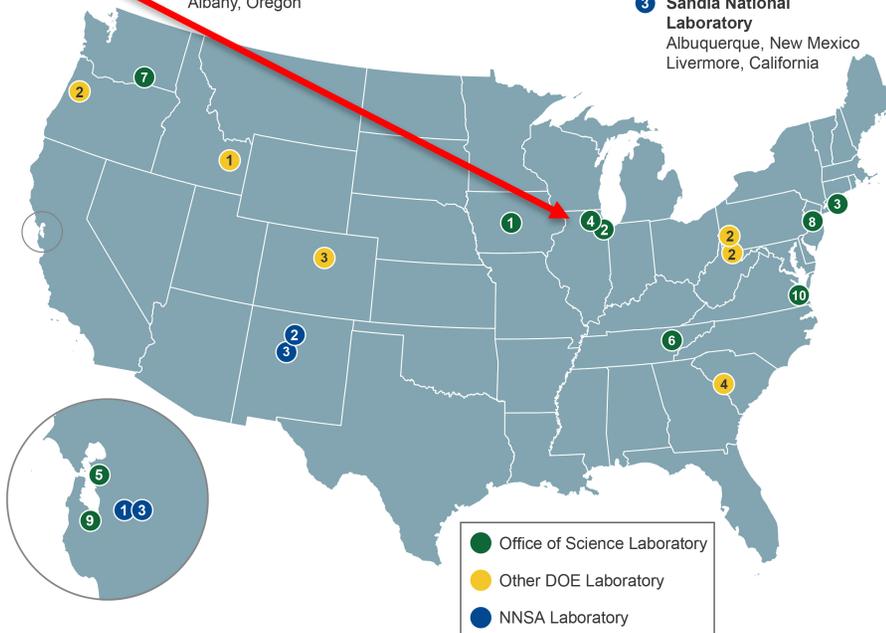
- 1 Ames Laboratory  
Ames, Iowa
- 2 Argonne National Laboratory  
Argonne, Illinois
- 3 Brookhaven National Laboratory  
Upton, New York
- 4 Fermi National Accelerator Laboratory  
Batavia, Illinois
- 5 Lawrence Berkeley National Laboratory  
Berkeley, California
- 6 Oak Ridge National Laboratory  
Oak Ridge, Tennessee
- 7 Pacific Northwest National Laboratory  
Richland, Washington
- 8 Princeton Plasma Physics Laboratory  
Princeton, New Jersey
- 9 SLAC National Accelerator Laboratory  
Menlo Park, California
- 10 Thomas Jefferson National Accelerator Facility  
Newport News, Virginia

## Other DOE Laboratories

- 1 Idaho National Laboratory  
Idaho Falls, Idaho
- 2 National Energy Technology Laboratory  
Morgantown, West Virginia  
Pittsburgh, Pennsylvania  
Albany, Oregon
- 3 National Renewable Energy Laboratory  
Golden, Colorado
- 4 Savannah River National Laboratory  
Aiken, South Carolina

## NNSA Laboratories

- 1 Lawrence Livermore National Laboratory  
Livermore, California
- 2 Los Alamos National Laboratory  
Los Alamos, New Mexico
- 3 Sandia National Laboratory  
Albuquerque, New Mexico  
Livermore, California



Together, the **17 DOE laboratories** comprise a preeminent federal research system, providing the Nation with strategic scientific and technological capabilities. The laboratories:

- Execute long-term government scientific and technological missions, often with complex security, safety, project management, or other operational challenges;
- Develop unique, often multidisciplinary, scientific capabilities beyond the scope of academic and industrial institutions, to benefit the Nation's researchers and national strategic priorities; and
- Develop and sustain critical scientific and technical capabilities to which the government requires assured access.

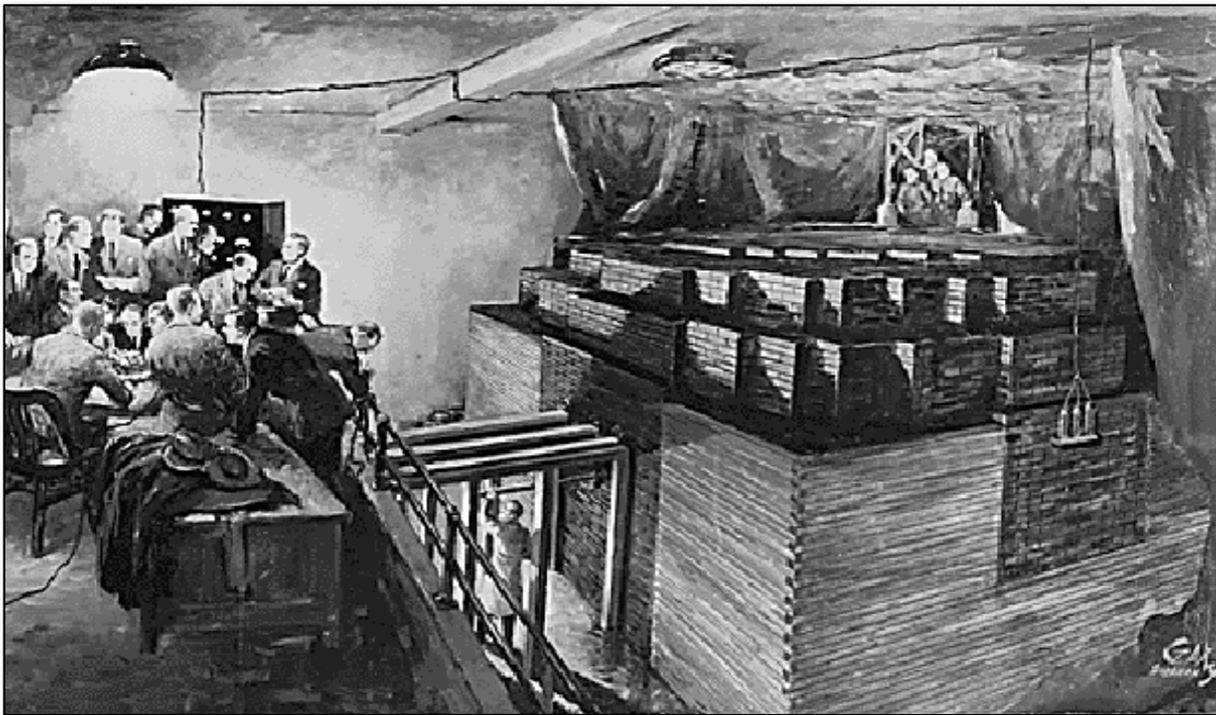
Source: [https://science.energy.gov/~media/\\_images/laboratories/DOE\\_Laboratories\\_Map\\_2014\\_Hi-res.jpg](https://science.energy.gov/~media/_images/laboratories/DOE_Laboratories_Map_2014_Hi-res.jpg)

9 ATPESC 2017, July 30 – August 11, 2017



# The origin of Argonne National Laboratory

## CP-1 under the stands of Stagg field of U. Chicago

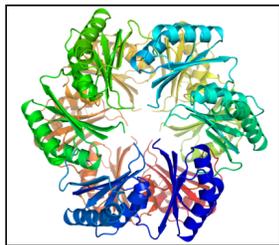


**Chicago Pile-1** was the world's first artificial nuclear reactor. The first man-made self-sustaining nuclear chain reaction was initiated on December 2, 1942

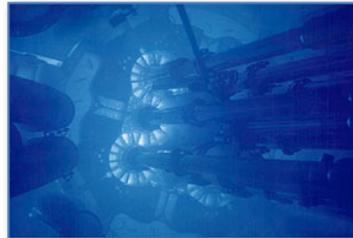
# Argonne's mission: To provide science-based solutions to pressing global challenges



Energy Science



Environmental Sustainability



Nuclear and National Security

## RESEARCH DIVISIONS

### Computing, Environment and Life Sciences

BIO	Biosciences
EVS	Environmental Science
MCS	Mathematics and Computer Science

### Energy and Global Security

ES	Energy Systems
GSS	Global Security Sciences
NE	Nuclear Engineering

### Photon Sciences

ASD	Accelerator Systems
AES	APS Engineering Support
XSD	X-ray Science

### Physical Sciences and Engineering

CSE	Chemical Sciences and Engineering
HEP	High Energy Physics
MSD	Materials Science
NST	Nanoscience and Technology
PHY	Physics

## FACILITIES, CENTERS, AND INSTITUTES

### User Facilities

APS	Advanced Photon Source
ALCF	Argonne Leadership Computing Facility
ATLAS	Argonne Tandem Linear Accelerator System
ARM	ARM Southern Great Plains
CNM	Center for Nanoscale Materials

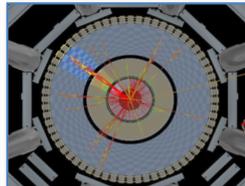
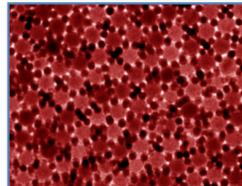
### Centers and Joint Institutes

AAI	Argonne Accelerator Institute
ACCESS	Argonne Collaborative Center for Energy Storage Science
ADW	Argonne Design Works
ALI	Argonne Leadership Institute
CEES	Center for Electrochemical Energy Science
CTR	Center for Transportation Research
CRI	Chain Reaction Innovations
CI	Computation Institute
IACT	Institute for Atom-Efficient Chemical Transformations
IGSB	Institute for Genomics and Systems Biology
IME	Institute for Molecular Engineering
JCESR	Joint Center for Energy Storage Research
MCSG	Midwest Center for Structural Genomics
NSP	National Security Programs
NAISE	Northwestern-Argonne Institute for Science and Engineering
RISC	Risk and Infrastructure Science Center
SBC	Structural Biology Center

*Use-Inspired Science and Engineering ...  
... Discovery and transformational Science and Engineering*



Major User Facilities



Science and Technology Programs

# Major Scientific User Facilities at Argonne

Advanced  
Photon  
Source



Argonne Tandem Linear  
Accelerator System



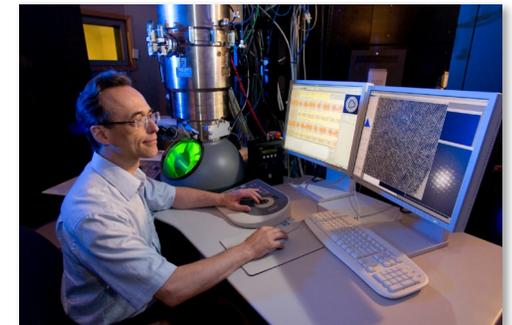
Center for  
Nanoscale  
Materials



Argonne  
Leadership  
Computing  
Facility

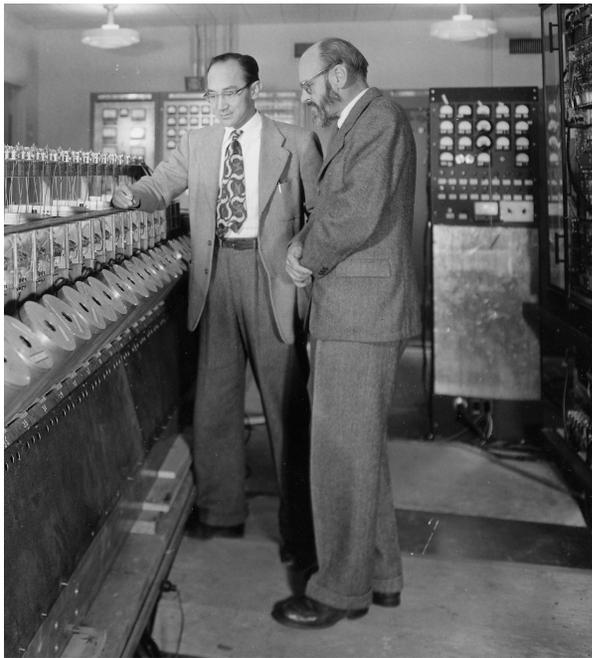


Electron  
Microscopy  
Center



# AVIDAC (1949-1953)

## Argonne's Version of the Institute's Digital Arithmetic Computer



“Moll” Flanders, Director  
Jeffrey Chu, Chief Engineer

- **AVIDAC: based on prototype at the Institute for Advanced Study in Princeton**
- **Margaret Butler wrote AVIDAC's interpretive floating-point arithmetic system**
  - Memory access time: 15 microsec
  - Addition: 10 microsec
  - Multiplication: 1 millisc
- **AVIDAC press release:  
100,000 times as fast as a trained “Computer” using a desk calculator**

# Early work on computer architecture



Margaret Butler helped assemble the ORACLE computer with ORNL Engineer Rudolph Klein

## In 1953...

ORACLE was the world's fastest computer, multiplying 12-digit numbers in .0005 seconds (2Kop/s).

Designed at Argonne, it was constructed at Oak Ridge.

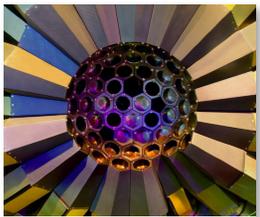
# Argonne National Laboratory Tour (if you signed in)

**Saturday, August 5 12:30 pm – 5:30 pm** (round-trip from Q Center to Argonne by bus with stop at downtown St. Charles on the way back)



**The Argonne Leadership Computing Facility (ALCF)** is one half of the U.S. Department of Energy's (DOE) Leadership Computing Facility, which deploys two diverse high-performance computer architectures that are 10 to 100 times more powerful than typical research computing.

**The Advanced Photon Source (APS)** is one of the most technologically complex machines in the world. The APS provides the brightest high-energy X-ray beams in the Western Hemisphere to more than 6,000 scientists each year from every U.S. state, the District of Columbia, Puerto Rico, and countries in the world.



**The Argonne Tandem Linac Accelerator System (ATLAS)** is the world's first ion accelerator using superconducting devices for the energy gain. It is capable of accelerating ions of all elements, both stable and radioactive, from hydrogen to uranium for research into the properties of the nucleus, the core of matter, the fuel of stars.

~~**The Nuclear Energy Exhibit (NEE)** showcases Argonne's rich heritage in the development of nuclear reactors and its current role in the development of next-generation reactors and fuel cycle technologies.~~



# Aerial view of Argonne National Laboratory

Advanced  
Photon  
Source  
(APS)

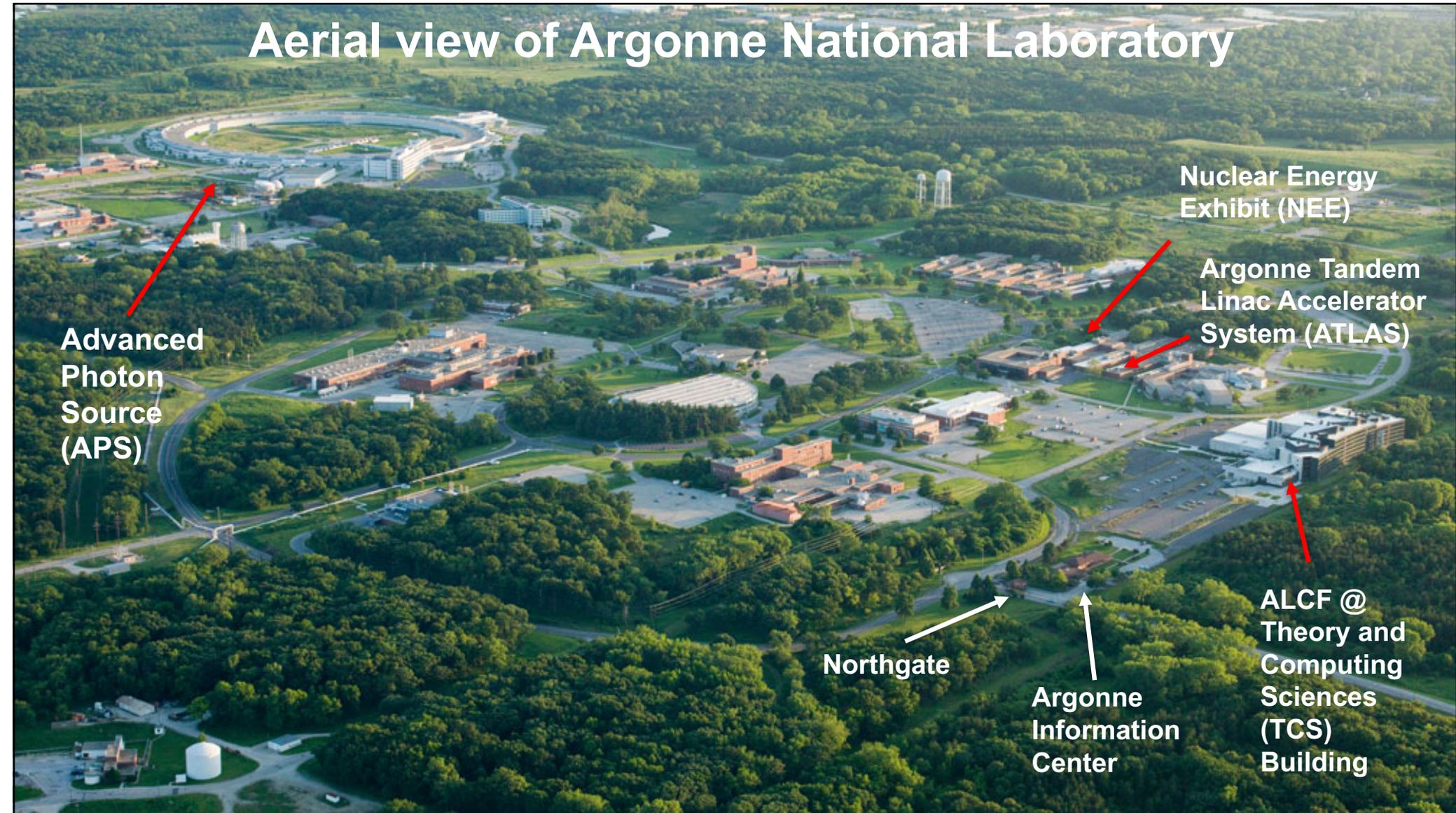
Nuclear Energy  
Exhibit (NEE)

Argonne Tandem  
Linac Accelerator  
System (ATLAS)

Northgate

Argonne  
Information  
Center

ALCF @  
Theory and  
Computing  
Sciences  
(TCS)  
Building

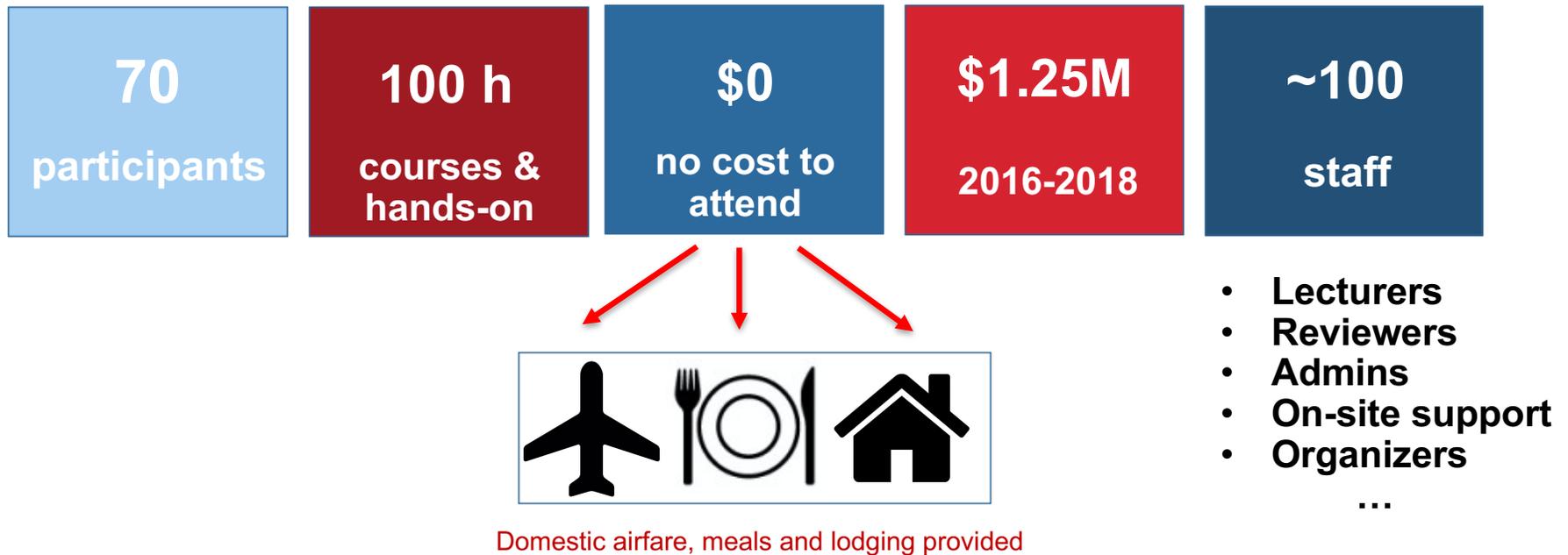


# Motivation of the ATPESC

# Motivation of the ATPESC

- Today's most **powerful supercomputers** have **complex hardware architectures** and **software environments**
  - and even greater complexity is on the horizon on next-generation and exascale systems
- The **scientific and engineering applications** that are tackled with these systems are themselves **complex**
- There is a **critical need for specialized, in-depth training for the computational scientists** poised to facilitate breakthrough science and engineering using these systems

# ATPESC by the numbers



# The Curriculum

# Curriculum Tracks and their leaders

- **Track 1: Hardware Architectures** – [Pete Beckman](#)
- **Track 2: Programming Models and Languages** – [Rajeev Thakur and Pavan Balaji](#)
- **Track 3: Data-intensive Computing and I/O** – [Rob Latham and Phil Carns](#)
- **Track 4: Numerical Algorithms and Software for Extreme-Scale Science**  
– [Lois McInnes, Lori Diachin and Mark Miller](#)
- **Track 5: Performance Tools and Debuggers**– [Ray Loy and Scott Parker](#)
- **Track 6: Software Engineering** – [Katherine Riley and Anshu Dubey](#)
- **Track 7: Visualization and Data Analysis** – [Mike Papka and Joe Insley](#)

## Dinner Talks

- Purpose: present additional topics that will probably be relevant to your research at some point in your career – but in any case interesting



**Edward Seidel**  
UIUC



**Francine Berman**  
RPI



**Michael J. Franklin**  
UChicago



**Rick Stevens**  
ANL



**Rupak Biswas**  
NASA



**Tom Evans**  
ORNL



**Cleve Moler**  
MathWorks



**Peter Kogge**  
Univ. of Notre Dame



**Narayanan Kasthuri**  
ANL

# ATPESC Resources

- + AWS & qwiklabs (NVIDIA)
- + IBM Quantum Computing
- + Jupyter

The screenshot shows the 'User Facilities at a Glance' page for ASCR User Facilities. The page is titled 'User Facilities at a Glance' and 'ASCR User Facilities'. It features a navigation menu on the left with options like 'All User Facilities', 'ASCR User Facilities', 'BES User Facilities', 'BER User Facilities', 'FES User Facilities', 'HEP User Facilities', and 'NP User Facilities'. The main content area lists four national scientific user facilities:

- Argonne Leadership Computing Facility (ALCF)** at Argonne National Laboratory. The ALCF provides the computational science community with a world-class computing capability dedicated to breakthrough science and engineering.
- Energy Sciences Network (ESnet)** at Lawrence Berkeley National Laboratory. The ESnet is a high-speed network serving thousands of Department of Energy researchers and collaborators worldwide.
- National Energy Research Scientific Computing Center (NERSC)** at Lawrence Berkeley National Laboratory. The NERSC is the mission high performance computing facility for the Department of Energy's Office of Science, and is a world leader in accelerating scientific discovery through computation.
- Oak Ridge Leadership Computing Facility (OLCF)** at Oak Ridge National Laboratory. The OLCF provides the computational science community with world-class computing capability dedicated to breakthrough science and engineering.

At the bottom left of the screenshot, there is contact information for the Office of Science: U.S. Department of Energy, 1000 Independence Ave., SW, Washington, DC 20585, P: (202) 586-5430.

Source: <https://science.energy.gov/user-facilities/user-facilities-at-a-glance/ascr/>

23 ATPESC 2017, July 30 – August 11, 2017

 **ALCF** – Mira, Cetus, Vesta, Cooley and Theta

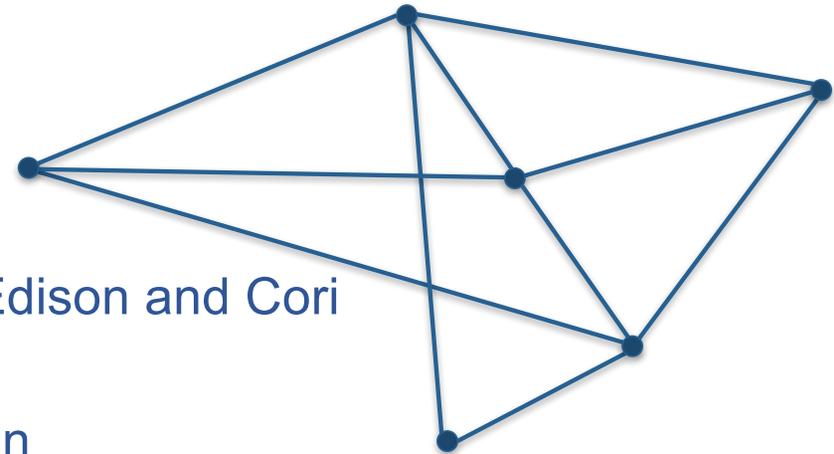
 **ESnet**  
ENERGY SCIENCES NETWORK

 **NERSC** – Edison and Cori

 **OLCF** – Titan

 **Argonne**  
NATIONAL LABORATORY

 **ECIP**  
EXASCALE  
COMPUTING  
PROJECT



## Yes, the ATPESC is an intensive program

- Many lectures every day, followed by evening hands-on sessions
- Ideally we would cover all topics in more depth but the result would be a six-week program
  - But few people's schedules would allow them to participate
- Note the 8:30 am starting time, dinner at 5:30 pm right after the end of the afternoon lectures, evening sessions

# ATPESC Deliverables

## Presentations

The slides of the Lectures will be available before the talk with the exception of the Dinner Talks (to keep some mystery)



All presentations will be available under a Box folder at the end of the program

## Videos

The videos of the Lectures will be available by mid-September on the Argonne Youtube Channel

<https://www.youtube.com/user/ArgonneNationalLab>

# Goals for today



## Check-in (hotel and program)



## ATPESC Resources

- Pick up ALCF and OLCF tokens, and NERSC account instructions
- Log in to all ATPESC Resources



## Introductions and discussions



## Plan your time at ATPESC

- Agenda, tracks, breaks ...
- Location, activities, food ...

# Goals for the next two weeks



**Get inspired**

**New ideas**

**Challenge your science and codes**



**Take advantage of ATPESC Resources**

- Pick up ALCF and OLCF tokens, and NERSC account instructions
- Log in to all ATPESC Resources



**Talk with Lecturers, Participants, support staff...**



**& Enjoy!**

# Logistics and reminders

# ATPESC Website

[extremecomputingtraining.anl.gov](http://extremecomputingtraining.anl.gov)

[HOME](#) [ABOUT ATPESC](#) [ATPESC NEWS](#) [AGENDA 2017](#) [PARTICIPANTS 2017](#) [LECTURERS 2017](#) [VENUE 2017](#) [PAST PROGRAMS](#)



# ATPESC

ARGONNE TRAINING PROGRAM ON EXTREME-SCALE COMPUTING

[Agenda 2017](#)

**WHEN**  
July 30 - August 11, 2017

**WHERE**  
St. Charles, IL  
Q Center

# Go to the ATPESC agenda

<https://extremecomputingtraining.anl.gov/agenda-2017/>



HOME ABOUT ATPESC ATPESC NEWS **AGENDA 2017** PARTICIPANTS 2017 LECTURERS 2017 VENUE 2017 PAST PROGRAMS

## Agenda 2017

Filter by track Filter by location Filter by days

July 30, 2017

2:00 pm - 4:00 pm	<b>On-site Check-in</b> Room D L202	More info >
4:00 pm - 4:30 pm	<b>Introduction to ATPESC</b> St. Charles Amphitheater  Marta Garcia Martinez, ANL	More info >
4:30 pm - 5:30 pm	<b>Presentation: Quick Start on ATPESC Resources</b> St. Charles Amphitheater  Ray Loy, ANL	More info >

- Filter by track
- All
  - Hardware Architectures
  - Programming Models and Languages
  - Data Intensive Computing and I/O
  - Numerical Algorithms and Software for Extreme-Scale Science
  - Performance Tools and Debuggers
  - Software Productivity
  - Visualization and Data Analysis
  - Dinner Talks

- Filter by days
- All
  - July 30, 2017
  - July 31, 2017
  - August 1, 2017
  - August 2, 2017
  - August 3, 2017
  - August 4, 2017
  - August 5, 2017
  - August 6, 2017
  - August 7, 2017
  - August 8, 2017
  - August 9, 2017
  - August 10, 2017
  - August 11, 2017

- Filter by location
- All
  - Q Tower Dining
  - Room D L202
  - Fox River Ballroom 1
  - Fox River Ballroom 3
  - St. Charles Amphitheater

# Go to the ATPESC agenda



HOME ABOUT ATPESC ATPESC NEWS **AGENDA 2017** PARTICIPANTS 2017 LECTURERS 2017 VENUE 2017 PAST PROGRAMS

## Agenda 2017

Filter by track ▾ Filter by location ▾ Filter by days ▾

July 30, 2017

2:00 pm - 4:00 pm

[On-site Check-in](#)  
Room D L202

More info >

4:00 pm - 4:30 pm

[Introduction to ATPESC](#)  
St. Charles Amphitheater

More info >



Marta Garcia Martínez, ANL

**Click here:  
"More info"**



# Go to the ATPESC agenda



ABOUT ATPESC

ATPESC NEWS

AGENDA 2017

PARTICIPANTS 2017

LECTURERS 2017

VENUE 2017

PAST PROGRAMS

## Introduction to ATPESC



Slide Presentation

LOCATION: **St. Charles Amphitheater**

DATE: **July 30, 2017**

TIME: **4:00 pm - 4:30 pm**



MARTA  
GARCÍA  
MARTÍNEZ,  
ANL

**Click here**

# ATPESC Pocket Folder

Contains information about:

- Maps of the Q Center (Conference Area, Guest, Aerobic Mile Chart)
- Restaurants around Q Center
- Some flyers of the systems that you will be using
- WIFI connection
- ANL tour flyers
- *Argonne Now* magazine
- Information about tokens and what to do in case of problems (provided during check-in)

# General Logistics

- Breakfast & Lunch in the Q Tower Dining
- Menus will be sent after this talk.
- A photographer will stop by one day to take a **group photo**. We will let you know in advance.
- An Argonne team might conduct brief **interviews** with some participants.
- Buses location** for ANL Tour and ORD transportation (8/11) will depart from the South Entrance (close to the Gift Shop)



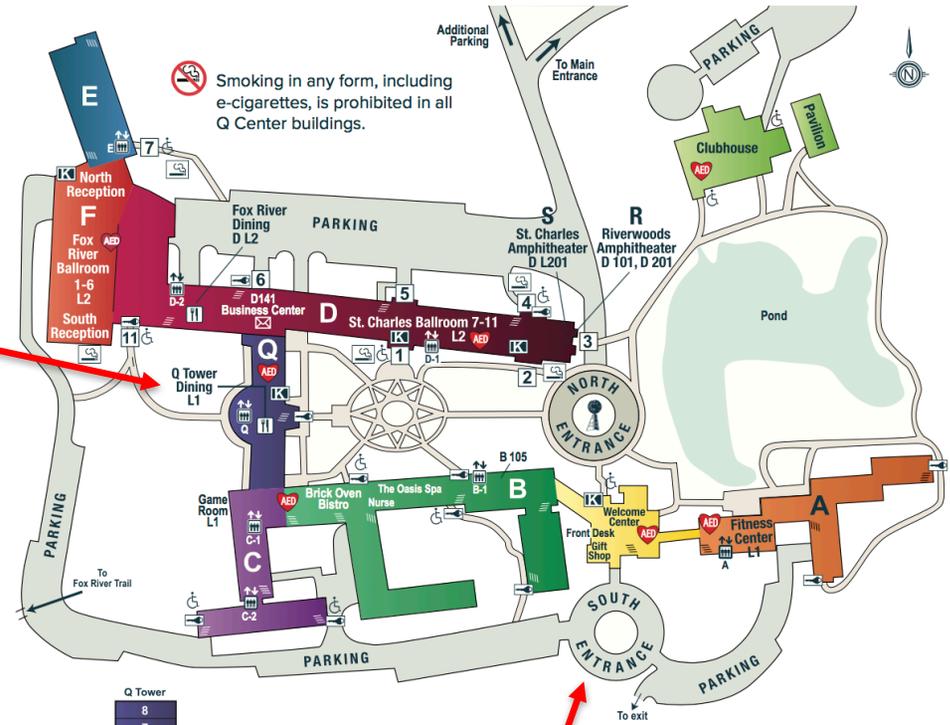
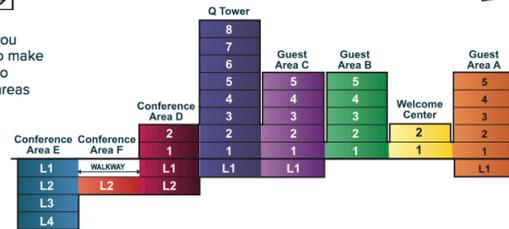
	Elevator
	Entrance
	Keycard entrance
	Accessible entrance
	Stairs
	Automatic External Defibrillator
	Smoking shelter
	Kiosk (Internet)
	Business Center
	Conference Dining

### Navigating Q

Signs like this are posted on hallway ceilings and above doorways to help you find your way.



Current area and floor    Areas you're headed toward    Turns you need to make to get to those areas



Smoking in any form, including e-cigarettes, is prohibited in all Q Center buildings.

Download our app today for navigation, event information and services!

Download on the App Store | GET IT ON Google Play

1405 North Fifth Ave. | St. Charles, IL 60174 | 877.774.8437 | Front Desk 630.377.3100 | qcenter.com

080916



# General Logistics

- All lectures and hands-on sessions in the Lecturer Room in the St. Charles Amphitheater
- Dinner Talks in the Fox River Ballroom 1 (week 1) and 3 (week 2)
- Nourishment Hubs available; 8 – 11 am and 2 – 5 pm
- Office hours: 8 am – 5 pm (lunch break closed: 12 – 1 pm)



# Mens sana in corpore sano

*Mens sana in corpore sano* is a Latin phrase, usually translated as "a healthy mind in a healthy body". The phrase is widely used in sporting and educational contexts to express the theory that physical exercise is an important or essential part of mental and psychological well-being. (\*)

Source: [https://en.wikipedia.org/wiki/Mens\\_sana\\_in\\_corpore\\_sano](https://en.wikipedia.org/wiki/Mens_sana_in_corpore_sano)

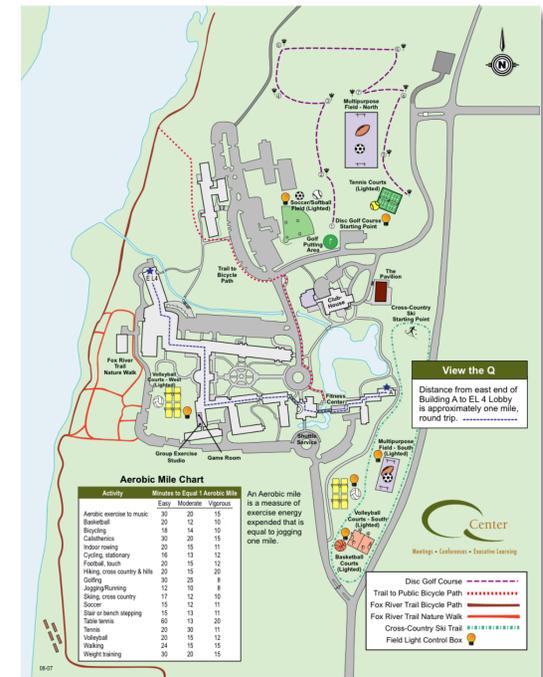
SUN 30 Jul	MON 31 Jul	TUE 1 Aug	WED 2 Aug	THU 3 Aug	FRI 4 Aug	SAT 5 Aug
▲ First Light 5:14 am	▲ First Light 5:15 am	▲ First Light 5:16 am	▲ First Light 5:17 am	▲ First Light 5:18 am	▲ First Light 5:20 am	▲ First Light 5:21 am
☀ Sunrise 5:45 am	☀ Sunrise 5:46 am	☀ Sunrise 5:47 am	☀ Sunrise 5:48 am	☀ Sunrise 5:49 am	☀ Sunrise 5:50 am	☀ Sunrise 5:51 am
🌇 Sunset 8:13 pm	🌇 Sunset 8:12 pm	🌇 Sunset 8:11 pm	🌇 Sunset 8:09 pm	🌇 Sunset 8:08 pm	🌇 Sunset 8:07 pm	🌇 Sunset 8:06 pm
▼ Last Light 8:44 pm	▼ Last Light 8:43 pm	▼ Last Light 8:42 pm	▼ Last Light 8:41 pm	▼ Last Light 8:39 pm	▼ Last Light 8:38 pm	▼ Last Light 8:37 pm

SUN 6 Aug	MON 7 Aug	TUE 8 Aug	WED 9 Aug	THU 10 Aug	FRI 11 Aug
▲ First Light 5:22 am	▲ First Light 5:23 am	▲ First Light 5:24 am	▲ First Light 5:25 am	▲ First Light 5:26 am	▲ First Light 5:27 am
☀ Sunrise 5:53 am	☀ Sunrise 5:54 am	☀ Sunrise 5:55 am	☀ Sunrise 5:56 am	☀ Sunrise 5:57 am	☀ Sunrise 5:58 am
🌇 Sunset 8:05 pm	🌇 Sunset 8:03 pm	🌇 Sunset 8:02 pm	🌇 Sunset 8:01 pm	🌇 Sunset 7:59 pm	🌇 Sunset 7:58 pm
▼ Last Light 8:35 pm	▼ Last Light 8:34 pm	▼ Last Light 8:33 pm	▼ Last Light 8:31 pm	▼ Last Light 8:30 pm	▼ Last Light 8:28 pm

Source: <http://sunrisesunset.willyweather.com/il/kane-county/st-charles.html>

## Aerobic Mile Chart @ Q Center



# Meals

## Breakfast

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
Scrambled Eggs	Scrambled Eggs	Scrambled Eggs	Scrambled Eggs	Scrambled Eggs	Scrambled Eggs	Scrambled Eggs
Chef's Potatoes	hashbrowns	Chef's Potatoes	hashbrowns	Chef's Potatoes	Chef's Potatoes	Chef's Potatoes
Hickory Smoked Bacon	Pork Sausage	Hickory Smoked Bacon	Chicken Apple Sausage	Hickory Smoked Bacon	Sausage Links	Hickory Smoked Bacon
Blueberry Scones	Cheese Blintz	Belgian Waffles	blueberry Pancakes	apple Crepes	Belgian Waffles	Pancakes

All Breakfast MOD's Include Bakery Breads and Pastries, Milk, Dry Cereal, Yogurt, Toast & Seasonal Fruit. Freshly Brewed Regular and Decaffeinated Coffees, Specialty Teas, Milk, Assorted Juices, and Assorted Sodas.

## Lunch

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
Bean and Sausage Soup	Chicken Noodle Soup	Vegetable Beef	Tomato Basil Soup	Cheddar Broccoli	Chef's Choice	Chef's Choice
Tossed Salad du Jour with 2 Dressings	Tossed Salad du Jour with 2 Dressings	Tossed Salad du Jour with 2 Dressings	Tossed Salad du Jour with 2 Dressings	Tossed Salad du Jour with 2 Dressings	Tossed Salad du Jour with 2 Dressings	Tossed Salad du Jour with 2 Dressings
Leek Mac and Cheese	Cheese Stuffed Shell	Breaded Brotchobels				
Balsamic Glazed Mahi over Mango Puree	Spicy tilapia with Pineapple Relish					
Bulgoga Beef Tacos	Chicken Enchilada					
Black Bean and Quinoa Curried Rice	Fiesta Lime Rice					
Sweet and Spicy Cauliflower	Sweet Poached Carrot					
White Chocolate Macadamia Nut Cookie	Triple Chocolate Cook					
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
toarnto Dill and White Bean	Chicken Tortilla Soup	Tortellini and Italian Sausage Soup	Toarnto Basil Soup	Swiss Chicken Noodle	Chef's Choice	Chef's Choice
Arctic Char with Chipotle Glaze over Honey Puree	Lemon Piccata Whitefish	Red Curried Cod with Pineapple/Mango Salsa	Mustard Crusted Salmon	Cajun Spiced Mahi over Creole Sauce	Chef's Choice	Chef's Choice
Lemon Basil chicken	Tacos al Pastor	Orange BBQ Pork Chops	Chicken Shawarama	Chicken Vesuvio	Chef's Choice	Chef's Choice
Roasted Red Skinned potatoes with and Herb Butter	Saffron Cous Cous with Peas	Roasted Yukon Potatoes	basmati Rice	Red Beans and rice	Chef's Choice	Chef's Choice
Sauteed Zucchini and Yellow Squash	Mexican Corn	Chimichurri Cauliflower	Steamed Asparagus	Roasted Seasonal Vegetables	Chef's Choice	Chef's Choice
White Chocolate Macadamia Nut Cookie	Triple Chocolate Cookie	Peanut Butter Cookie	Heath Crunch Cookie	Chocolate Chip Cookie	Assorted Cookies	Assorted Cookies

**Note:** All menu items are subject to change without notice.

The MOD lunches that are attached are VERY limited to what will be available in the dining room. This is only for the private meals which are based off of what is offered in the dining room. Please check the app daily to see the full menu selection.

# Nourishment Hubs

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Serving Times	All Day						
Flavored Waters	Cucumber / Kiwi	Watermelon	Orange	Pineapple / Basil	Lemon / Mint	Orange	Pineapple
Serving Times	7:30a-9:30a						
	Homemade granola*						
Serving Times	7:30a-11a						
Sliced Fresh Fruit	Trail Mix*						
Additional Sweet Item	Watermelon	Honey Dew	Cantaloupe	Watermelon	Honey Dew	Cantaloupe	Honey Dew
Morning Pastry	Gluten Free Mango Swirl Cake**	Mini Blueberry Muffins*	Gluten Free Marble Coffeecake*	Mini Chocolate Chip Muffin*	Lemon Scone*	Chef's Choice	Chef's Choice
Baked Breakfast Bread	Chocolate Breakfast Bread*	Pineapple Coconut Bread*	Cherry Vanilla Bread*	Raspberry Orange Bread*	Banana Bread*	Banana Bread*	Cherry Vanilla Bread*
Baked Breakfast Item	Croissants with jam, whipped butter	Fresh baked biscuits w/ jam, whipped butter	Croissants with jam, whipped butter	Fresh baked biscuits w/ jam, whipped butter	Croissants with jam, whipped butter	Fresh baked biscuits w/ jam, whipped butter	Croissants with jam, whipped butter
Power bars	Peanut Butter and Oatmeal Energy Bar*	Chocolate Energy Bar*	Lemon Energy Bar*	Cashew & Apricot Bar*	Brownie Energy Bar*	Chef's Choice Energy Bar	Chef's Choice Energy Bar
Serving Times	9:30a - 11a						
Protein Item	Hard cooked eggs with hot sauce and salt & pepper	Hard cooked eggs with hot sauce and salt & pepper	Hard cooked eggs with hot sauce and salt & pepper	Hard cooked eggs with hot sauce and salt & pepper	Hard cooked eggs with hot sauce and salt & pepper	Hard cooked eggs with hot sauce and salt & pepper	Hard cooked eggs with hot sauce and salt & pepper
Serving Times	7p-9p						
Kitchen Station	Agave Roasted Chickpeas***	Garlic & Parm. Roasted Chickpeas	Lime, Cumin & Cilantro Roasted Chickpeas	Honey Cinnamon Roasted Chickpeas	Sweet & Spicy Roasted Chickpeas w/ Rosemary	Garlic & Parm. Roasted Chickpeas	Honey Cinnamon Roasted Chickpeas
	Hummus	Ranch Dip	Pico de Gallo	Peanut Butter	Nutella spread	Ranch Dip	Peanut Butter
	Carrots	Celery	Corn Tortilla Chips	Celery Sticks	Cinnamon Sugar Crisps	Celery	Celery Sticks
Serving Times	7p-9p						
Baked Goods	Ice Cream Novelties	Sugar Cookie*	Chewy Chocolate Cookie*	M & M Cookie*	Oatmeal Raisin Cookie*	Sugar Cookie*	M & M Cookie*
Baked Treats	Orange Texas Sheet Cake*	Chocolate Shortbread*	Rice Krispy Treats	Brownies*	Cherry Bar*	Rice Krispy Treats	Shortbread*
Fruit	Strawberries	Sliced Apples	Orange wedges	Strawberries	Grapes	Orange wedges	Grapes

## Dinner

Date	Time	Room
7/30/17	5:30 PM - 7:00 PM	Fox River Ballroom 1
Food		
Function: Dinner Talk		
Room: Fox River Ballroom 1 Time: 5:30 PM to 7:00 PM		
Roasted Tomato Bisque Tossed Greens Salad with Assorted Dressings Artisan Breads and Rolls with Butter .... Cheese Tortellini with Vodka Cream Sauce Grilled Sirloin Steaks with Red Wine Demi and Fresh Herbs Shrimp Pepperonata .... Roasted Potatoes & Asparagus .... Lemon Bites Assorted Hot and Cold Beverages .... Menu items are subject to change without notice		

# Participant Introductions

Today (7/30) after the Dinner Talk

## INSTRUCTIONS FOR PARTICIPANT INTRODUCTION SLIDE

**Section 1**

**Profile Picture** | Attach a recent photo (optional)  
**Name** | First, Last Name > Example: John Doe  
**Position** | Ph.D. Student, Postdoc, Engineer, etc.  
**Department, Institution** | > Example: Civil Engineering, Univ. of Houston, TX (USA)  
**University Logo and/or current Institutional Logo** (if you have one)

**Section 2**

**Scientific Field** | Pull field from the list below  
**Research Interests** | Name three (or more)  
**Personal Interests** | Name two (or more)

**Section 3**

**Graphic** | Attach a jpeg, png, tiff or an editable file of an image of your choice about your work

### List of Scientific Fields

- Biological Sciences, Bioinformatics
- Biological Sciences, Biophysics
- Biological Sciences, Medical Science
- Biological Sciences, Neuroscience
- Biological Sciences, Proteomics
- Biological Sciences, Systems Biology
- Chemistry, General
- Chemistry, Biochemistry
- Chemistry, Catalytic
- Chemistry, Combustion
- Chemistry, Environmental
- Chemistry, Geochemistry
- Chemistry, Inorganic
- Chemistry, Organic
- Chemistry, Physical
- Chemistry, Quantum Chemistry
- Computer Science
- Earth Science, Environmental Sciences
- Earth Science, Agricultural Sciences
- Earth Science, Climate Research
- Earth Science, Geological Sciences
- Economics
- Engineering, Material Response
- Engineering, Heat Transfer
- Engineering, Aerodynamics
- Engineering, Fluid-Structure Interaction
- Engineering, Fluids and Turbulence
- Fusion Energy, Inertial Fusion
- Fusion Energy, Magnetic Fusion
- Materials Science, Condensed Matter and Materials Physics
- Materials Science, Materials Discovery, Design, and Synthesis
- Materials Science, Nanoelectronics
- Materials Science, Nanomechanics
- Materials Science, Nanophotonics
- Materials Science, Nanoscience
- Nuclear Energy
- Physics, Accelerator Physics
- Physics, Astrophysics
- Physics, Atomic/Molecular Physics
- Physics, Condensed Matter Physics
- Physics, High Energy Physics
- Physics, Nuclear Physics
- Physics, Space Physics
- Physics, Particle Physics
- Physics, Plasma Physics
- Energy Technologies, Bioenergy
- Energy Technologies, Wind Energy
- Energy Technologies, Solar Energy
- Energy Technologies, Energy Efficiency
- Energy Technologies, Energy Storage
- Energy Technologies, Energy Grid
- Mathematics



ATPESC 2017, July 30 – August 11, 2017

**Section 1**



**John Doe**  
 Ph.D. Student  
 Civil Engineering, University of Houston  
 Houston, TX (USA)



**Section 2**

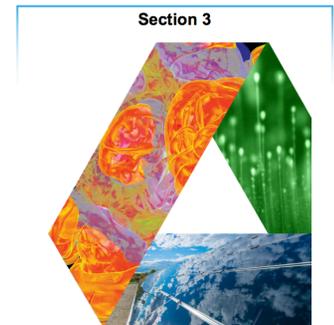
**Scientific Field** | Mathematics

### Research Interests

- Subsurface flow and transport
- Finite Element Methods
- High-Performance Computing

### Personal Interests

- Tennis
- Fishing



ATPESC 2017, July 30 – August 11, 2017



Marta García Martínez 

Principal Project Specialist – Computational Science  
Argonne National Laboratory  
Argonne, IL (USA)



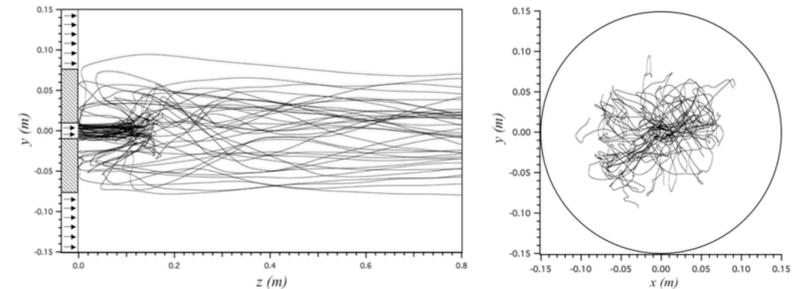
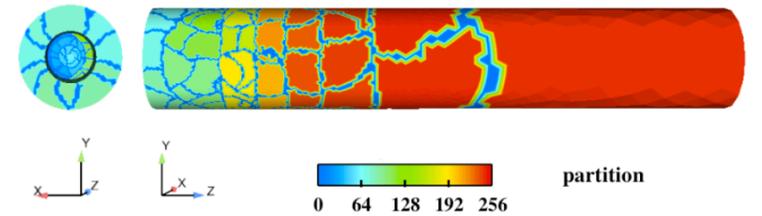
**Scientific Field** | Computational Fluid Dynamics

## Research Interests

- Two-phase Flows
- High-Performance Computing
- Partitioning Algorithms

## Personal Interests

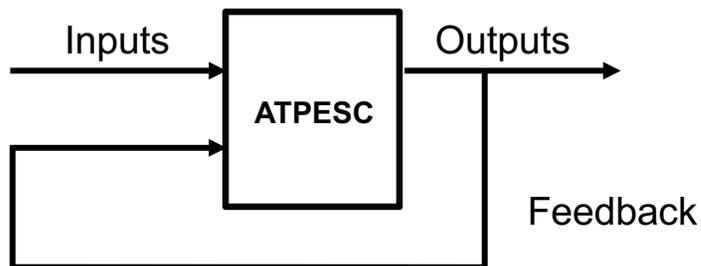
- Reading
- Traveling



# Feedback

Help us improve the training program

- Track evaluations
- Overall program evaluation
- Conversations or emails to any of us

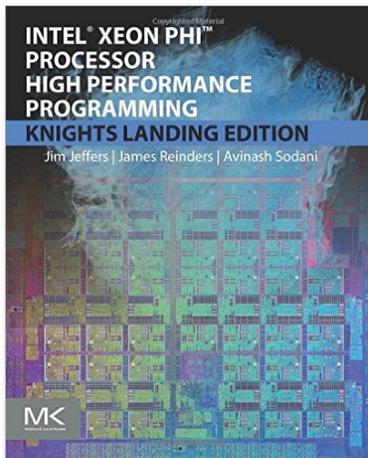


- [Tour of Argonne](#)
- [More hands-on exercises during lectures](#)
- [Participant introductions](#)

# Raffle: 12 nights ... 12 Books & 12 lanyards with flash drives

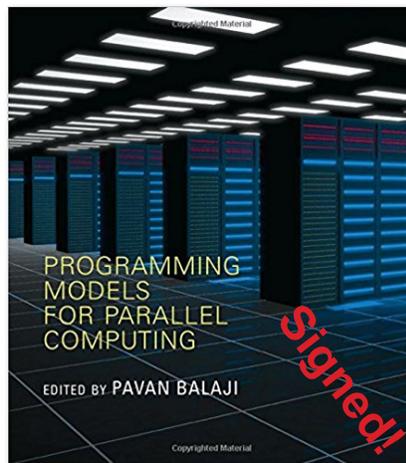
Special thanks to:

10x



**James Reinders & Intel**  
(Lecturer)

2x



**Pavan Balaji**  
(Track Lead and Lecturer)

12x



**Ashley Barker**  
(ECP 1.2.4. Developer Training and  
Productivity Lead)

# Whom to ask for help on-site

- **Administration**

- Office: Sue Gregurich or Renée Plzak  
Or by email to your ATPESC Contact Person

- **Computing issues**

- **User Services:** Liza Booker / Robert Scott / Avanthi Mantrala
- **Operations:** Adam Scovel / Ben Lenard / John 'Skip' Reddy  
Or by email to [support@alcf.anl.gov](mailto:support@alcf.anl.gov)

- **General**

- Marta García  
Or by email to [support@extremecomputingtraining.anl.gov](mailto:support@extremecomputingtraining.anl.gov)

# Acknowledgments

## Exascale Computing Project



EXASCALE COMPUTING PROJECT

**Website:** <https://exascaleproject.org>

This training and research was supported by the Exascale Computing Project (17-SC-20-SC), a collaborative effort of the U.S. Department of Energy Office of Science and the National Nuclear Security Administration.

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- This research used resources of the **National Energy Research Scientific Computing Center**, a DOE Office of Science User Facility supported by Office of Science of the U.S. Department of Energy under Contract DE-AC02-05CH11231

# Thank you for your attention!

&

for taking two weeks of your summer  
to participate in this program

