

# About RIKEN AICS

## Basic Concepts of AICS

The RIKEN Advanced Institute for Computational Science (AICS), one of RIKEN's centers, was founded in 2010 with aims to establish the science of forecasting based on computer simulation.

● Management of the operations of the K computer and maintain a user-friendly environment.

● Generate cutting-edge scientific results and technological breakthroughs by promoting collaborations and the integration of computational and computer science as an international center of excellence.

● Develop the post-K supercomputer and application software for it based on a roadmap for the future of computational science.



## From recent activities

### Data Assimilation Innovation Hub

In September 2016, RIKEN AICS has launched a project titled "Data assimilation as an innovation hub to connect mathematical science, experimental and observational science, and computational science."

Data assimilation (DA) is a cross-disciplinary science to synergize computer simulations and real-world data, based on statistical mathematics and dynamical systems theory.

DA has long been playing a crucial role in numerical weather prediction (NWP), and recently, DA started to be applied more widely to numerical simulations beyond geophysical applications, such as planetary science and biological science.

[*Data Assimilation Research Team, Research Division*]



### Collaboration with RIKEN Center for Advanced Intelligence Project (AIP)

RIKEN AICS is collaborating with Search and Parallel Computing Unit of RIKEN AIP in application areas for massively parallel search system.

[*System Software Development Team, Flagship 2020 Project*]

### Leading a consortium for automobile companies

RIKEN AICS leads a consortium for 11 Japanese automobile companies including manufactures and suppliers to promote next generation CAE systems on HPC.

[*Complex Phenomena Unified Simulation Research Team, Research Division*]



### RIKEN AICS Software Center\*

RIKEN AICS Software Center\* has been launched to develop and deploy high quality applications, libraries, programming tools, etc. (called "AICS software") for many platforms including the K computer and "Post-K", and to support AICS software users to promote High Performance Computing for various fields of science and engineering.

[*HPC Usability Development Team, Operations and Computer Technologies Division*]

\*official name TBA

# International Collaborations

## RIKEN & CEA

RIKEN and French Alternative Energies and Atomic Energy Commission, CEA signed a cooperation program in the fields of high performance computing and computational science on January 11, 2017.

The research collaboration includes preparation for exascale technologies. RIKEN and CEA are committed and collaborate to the development of ARM based solutions for the exascale and of the associated ecosystems.

This cooperation program promotes joint researches in HPC and computational science and foster young researchers who can lead the field in the future both in Japan and France.



### Program Details

1. Collaboration for developing open software libraries including programming language environment, runtime environment and energy-aware batch job scheduler.
2. Collaboration to develop simulation for the fields of quantum chemistry, condensed matter physics and seismic simulation for nuclear installation, etc.
3. Collaboration related to management of Key Performance Indicator and human resources



Summer school at CEA in 2017

## MOUs & Joint Research Projects

RIKEN AICS proactively promotes international collaboration activities with research institutions and universities from various countries.

| Country   | Research Institutions and Universities               | Research Area                         |
|-----------|--|---------------------------------------|
| USA       | NCSA, University of Illinois                         | computer & computational science      |
| USA       | University of Maryland                               | numerical modeling, data assimilation |
| UK        | University of Reading                                | numerical modeling, data assimilation |
| Italy     | International School for Advanced Studies, SISSA     | computational science                 |
| France    | CEA  | HPC, computer science                 |
| France    | Maison de la Simulation (MDLS), CNRS                 | computer & computational science      |
| Germany   | Jülich Supercomputing Center                         | computer & computational science      |
| Australia | NCI, Australia National University                   | computer & computational science      |
| China     | Beijing Computational Science Research Center        | computational and theoretical biology |
| Other     | JLESC (Joint Laboratory for Extreme-Scale Computing) | computer science                      |



# Education and Human Resource Development

RIKEN AICS offers educational programs to develop human resources, educate young researchers and students in the field of computer and computational sciences.

## *International HPC Summer School*

Since 2013, AICS has been participating as a host institute, sending lecturers and young researchers from Japan.



## *RIKEN AICS International HPC Computational Science Internship*

AICS has launched an international internship program. This program will foster researchers dedicated to HPC technology and computational science, with the aim to orient them to R&D in leading-edge computational science, by providing them with the opportunities to work in AICS research teams where they will gain a better understanding of computational science technology.



## *HPC Youth Workshop and HPC Summer / Spring School*

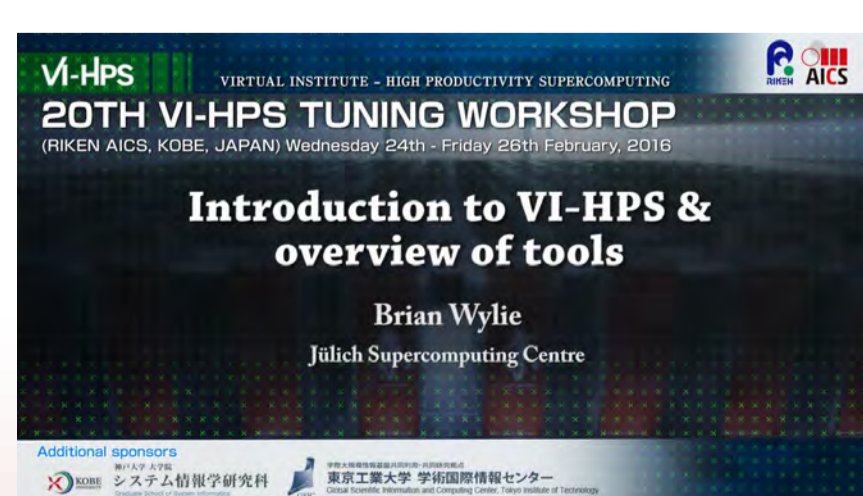
AICS has organized a Youth Workshop for young researchers and students in computational science and technology. Through English presentations and discussions, this workshop aims to create a network of collaborations among young researchers, and to foster their research communication skills in an international setting, as well as improving their own research through the discussion.



AICS hosts HPC School for young researchers. In this school, students learn about the basics of programming techniques for mastering the use of parallel computers. Summer School is a standard course and Spring School is an advanced course.

## *E-learning Archive*

AICS provides more than 150 video contents of e-learning archive related with computer and computational science from the website.



## *RIKEN AICS at SC17 Job Fair on Nov.15*

AICS may receive students for intern, and we will be seeking Postdoctoral Researcher or Research Scientist on some teams. Visit our desk for more detailed information!!