EUROPEAN UNION

EU-ASEAN
High-Performance Computing (HPC) Virtual School 2021:
System Design and HPC Applications

5-9 July 2021 · Zoom Webinar

This virtual school is organised by the ASEAN HPC Task Force and is carried out in the framework of the Enhanced Regional EU-ASEAN Dialogue Instrument (E-READI)

ABOUT

The EU-ASEAN High-Performance Computing (HPC) Virtual School 2021: System Design and HPC Applications is a hands-on virtual curriculum taught by foremost international experts in HPC technology. It is hosted by the National Science and Technology Development Agency (NSTDA) Supercomputer Center (ThaiSC), Thailand.

Over five days from 5 to 9 July 2021, 60 selected participants from the ASEAN Member States will learn about the fundamentals of HPC design and applications to critical domains such as COVID-19, urgent computing and climate science from international luminaries from Europe, ASEAN and Japan through formal and practical courses. By attending the school, the students will learn basic HPC design and programming skills to access local and international HPC platforms with proficiency. They will also gain exposure to international collaboration opportunities in an EU-ASEAN context. Students who complete all practical exercises will receive a digital certificate of participation. The top ten students ranked on the results of the practical exercises will receive a digital certificate of excellence and a guaranteed place in the next EU-ASEAN HPC School to be held in Bangkok, Thailand when conditions allow.

This virtual school is carried out in the framework of the Enhanced Regional EU-ASEAN Dialogue Instrument (E-READI). E-READI, a demand-driven instrument that supports ASEAN regional integration by strengthening EU-ASEAN networks and exchanging knowledge and experience in policy areas of joint interest. In addition to engaging with policymakers from EU and ASEAN institutions and the Member States, it facilitates ongoing and new dialogues with civil society, the private sector, and other relevant stakeholders across various policy areas. It further strengthens the standing EU-ASEAN Dialogue Meeting on Science and Technology and the EU-ASEAN Strategic Partnership.

Background

Since the identification of the need for a shared ASEAN HPC facility by the ASEAN HPC Task Force in 2018, a strong interest has been expressed in cooperating with European and international experts and profit from their experience in the sharing of regional resources, training capacities, and experience with HPC applications.

In this context, some ASEAN Member States students participated in the Association for Computing Machinery (ACM) summer school in HPC, in December 2019. ASEAN experts followed a week-long training at the Barcelona Supercomputing Centre. This EU-ASEAN High-Performance Computing (HPC) School is the most recent practical follow-up, announced recently at the Supercomputing Asia conference's EU-ASEAN-Japan Symposium on 4 March 2021.

PROGRAMME

DAY 1 · Monday, 5 July 2021

TIME (GMT+7)	PROGRAMME
08.30 – 09.00	**WELCOMING STUDENTS OF THE HPC VIRTUAL SCHOOL**
09.00 – 09.30	**OPENING REMARKS** **Dr Piyawut Srichaikul** ▸ Co-chair of ASEAN HPC Task Force **Prof. Sirirurg Songsivilai** ▸ Chair of the ASEAN COSTI **H.E Pirkka Tapiola** ▸ EU Ambassador to Thailand **Prof. J.W Saputro** ▸ Master of Ceremonies
09.30 – 10.00	Keynote Presentation **SERVICE MANAGEMENT FOR THE HPC ECOSYSTEMS** **Tay Kheng Tiong** ▸ Chairman of ASEAN HPC Taskforce / CEO, A*STAR, Computational Resource Center, Singapore
10.00 – 13.00	**MODULE 1: HPC SYSTEM: HARDWARE & SOFTWARE** Keynote Lecture **Overview of the Fugaku, Future Perspective** **Prof. Satoshi Matsuoka** ▸ Director of RIKEN, Center for Computational Science (R-CCS), Japan **Architectures of HPC Systems** **Dr Kentaro Sano** ▸ Team Leader, Professor Research Team, RIKEN R-CCS, Japan **Dr Masaaki Kondo** ▸ Team Leader, Next Generation High-Performance Architecture Research Team, RIKEN R-CCS, Japan **Software of HPC System** **Dr Kento Sato** ▸ Team Leader, High-Performance Supercomputing Big Data Research Team, RIKEN R-CCS, Japan
14.00 – 16.30	**MODULE 2: OVERVIEW OF THE EUROPEAN HPC ECOSYSTEM** **Outcomes of the EU-ASEAN HPC Mapping Study for ASEAN and European HPC Research Infrastructures** **Dr Sebastien Varrette** ▸ Luxembourg HPC Centre **Meluxina Tutorial** **Valentin Plugaru** ▸ CTO, LuxProvide, Luxembourg HPC Centre **LUMI Tutorial** **Dr Pekka Manninen** ▸ Director, LUMI Leadership Computing Facility, CSC Finland
16.30 – 17.00	**REVIEW OF SCHOOL PLANS AND EXPECTATIONS** **Dr Fabrizio Gagliardi** ▸ School Director **Aldo Dell'Ariccia** ▸ E-READI Team Leader
17.00 – 18.00	Invited Talk **OPPORTUNITIES FOR RESEARCHER CAREER DEVELOPMENT IN EUROPE** Moderated by: **Pierrick Fillon-Ashida** ▸ ASEAN Desk Officer, EU DG Research & Innovation (RTD) **Marie Sklodowska Curie Actions (MSCA) and European Research Council (ERC) Grants in Focus** **Prof. Jean-Pierre Bourguignon** ▸ President, European Research Council (ERC) **Claire Morel** ▸ Head of Unit, MSCA under Horizon Europe, EU Directorate-General for Education, Youth, Sport and Culture (DG EAC) **EURAXESS: Your Gateway to Research in Europe** **Dr Susanne Rentzow-Vasu** ▸ Regional Project Coordinator – EURAXESS ASEAN **Dr Jenny Lind Elmaco** ▸ Chair of the SEA Chapter of the Marie Curie Alumni Association

DAY 2 · Tuesday, 6 July 2021

TIME (GMT+7)	PROGRAMME
09.00 – 13.00	**MODULE 3: MATRIX COMPUTATION** **Dr Toshiyuki Imamura** ▸ Team Leader, Large-scale Parallel Numerical Computing Technology Research Team, RIKEN, Japan
14.00 – 14.45	Invited Talk **THE EUROHPC JOINT UNDERTAKING** **Anders Dam Jensen** ▸ Executive Director, EuroHPC
15.00 – 18.00	**MODULE 4: HPC PROGRAMMING TOOLS AND ENVIRONMENT** **How to make HPC applications scalable** **Prof. Jesus Labarta** ▸ Professor of Computer Architecture, Technical University of Catalonia (UPC), Spain

DAY 3 · Wednesday, 7 July 2021

TIME (GMT+7)	PROGRAMME
09.00 – 13.00	**MODULE 5: LARGE-SCALE SEQUENCE ANALYSIS WITH ALIGNMENT AND PHYLOGENETIC TREES** **Dr Sebastian Maurer-Stroh** ▸ Executive Director, Bioinformatics Institute (BII), Singapore **Molecular Dynamics: Understanding structure-function- dynamics relationships** **Dr Yuji Sugita** ▸ Team Leader, Computational Biophysics Research Team, RIKEN R-CCS, Japan **Dr Chigusa Kobayashi** ▸ Technical Scientist, Computational Biophysics Research Team, RIKEN R-CCS, Japan
14.00 – 16.15	**MODULE 6: INTEGRATIVE MODELLING OF BIOMOLECULAR COMPLEXES – TOWARD INTERACTOME MODELLING** **Prof. Alexandre Bonvin** ▸ Computational Structural Biology Group Department of Chemistry, Faculty of Science Utrecht University, Netherlands
16-15 – 16.30	**QUIZ**
16.30 – 17.30	Keynote Presentation **HPC FOR PERSONALIZED MEDICINE** **Prof. Alfonso Valencia** ▸ Director, Life Sciences Department Barcelona SuperComputing Center (BSC), Spain

DAY 4 · Thursday, 8 July 2021

TIME (GMT+7)	PROGRAMME
09.00 – 12.30	**MODULE 7: CLIMATE SIMULATION** **Introduction to climate modelling and its uncertainty** **Dr Hirofumi Tomita** ▸ Team Leader, Computational Climate Science Research Team, RIKEN R-CCS, Japan **Dr Dale Barker** ▸ Director, Center for Climate Research Singapore, CCRS
12.30 – 13.00	Invited Talk **COUPLING OF NUMERICAL WEATHER PREDICTION AND REGIONAL OCEANIC MODELS FOR THAILAND** **Kritanai Torsri** ▸ Hydro-Informatics Institute, HII, Thailand **THE OPERATIONAL WAVE FORECASTING SYSTEM FOR THE GULF OF THAILAND** **Watin Thanathanphon** ▸ Hydro-Informatics Institute, HII, Thailand
14.00 – 18.00	**MODULE 8: CLIMATE & AIR QUALITY MODELLING** **Introduction to Earth Science Fundamentals and Modelling** **Raffaele Bernardello** ▸ Established Researcher, Climate Prediction Group, Earth Science Department, BSC, Spain **Introduction to Atmospheric Chemistry Fundamentals and Modelling** **Oriol Jorba** ▸ Group Leader, Atmospheric Composition Group, Earth Science Department, BSC, Spain

DAY 5 · Friday, 9 July 2021

TIME (GMT+7)	PROGRAMME
09.00 – 11.30	**MODULE 9: URGENT COMPUTING ON NATURAL HAZARD, URBAN VULNERABILITY AND NATURAL DISASTER RISK** Sessions by Disaster Risk Computational Disaster Mitigation and Reduction Research Team, RIKEN Center for Computational Science (R-CCS), Japan **Automatic construction of three-dimensional group model by using Data Processing Platform** **Dr Tomohide Takeyama** ▸ Associate Professor, Department of Civil Engineering, KOBE University, Japan; Visiting Researcher, Disaster Risk Computational Disaster Mitigation and Reduction Research Team, R-CCS, Japan **High fidelity 3D tsunami inundation simulation and its application to disaster mitigation education using VR and AR** **Dr Mitsuteru Asai** ▸ Associate Professor, Department of Civil Engineering, Kyushu University **Debris flow simulation for rapid damage detection on employing machine learning** **Dr Kazuki Yamanoi** ▸ Assistant Professor, Disaster Prevention Research Institute, Kyoto University, Japan; Visiting Researcher Disaster Risk Computational Disaster Mitigation and Reduction Research Team, R-CCS, Japan **Prof. Satoru Oishi** ▸ Team Leader, Computing Disaster Migration and Reduction Research Team, R-CCS, Japan; Professor, Research Center for Urban Safety and Security Department of Civil Engineering, Graduate School of Engineering Kobe University, Japan
11.30 – 12.00	Keynote Presentation **HIGH PERFORMANCE COMPUTING CHALLENGE FOR MULTI HAZARD EARLY WARNING** **Prof. Dwikorita Karnawati** ▸ Head of Indonesian Agency for Meteorology, Climatology and Geophysics (BMKG Indonesia)
12.00 – 13.00	Keynote Presentation **QUANTUM SUPERCOMPUTERS** **Prof. José Ignacio Latorre** ▸ Director, Centre for Quantum Technologies, National University of Singapore (NUS), Singapore
14.00 – 16.00	**MODULE 10: URGENT COMPUTING FOR NATURAL DISASTERS** **ChEESE Center of Excellence** **Dr Arnau Folch** ▸ Team Leader, Environmental Simulation Group Manager, BSC, Spain **Faster Than Real-Time (FTRT) Tsunami Simulations** **Prof. Jorge Macias** ▸ Professor, Málaga University **Urgent Computing for Earthquakes** **Dr Josep de la Puente** ▸ Team Leader, BSC, Spain **Operational Forecast of Volcanic Ash Clouds** **Dr Arnau Folch** ▸ Team Leader, Environmental Simulation Group Manager, BSC, Spain
15.45 – 16.00	**Q&A AND QUESTIONNAIRE SESSION**

The transition from Classroom to Public event Master of Ceremonies: Prof. J.W Saputro

Panel Discussion:
The Future of High-Performance Computing (HPC)

Friday, 9 July 2021 at 16.00 – 18.30 (GMT+7)

TIME (GMT+7)	PROGRAMME
16.00 – 17.30	Panel Discussion **THE FUTURE OF HIGH-PERFORMANCE COMPUTING** Moderated by: **Anders Dam Jensen** ▸ Executive Director, EuroHPC Panellists: **Prof. Dwikorita Karnawati** ▸ Head of Indonesian Agency for Meteorology, Climatology and Geophysics (BMKG) **Prof. Jose Ignacio Latorre** ▸ Director, Centre for Quantum Technologies, Singapore **Dr Kimmo Koski** ▸ Director, CSC, Finland **Prof Mateo Valero** ▸ Director, Barcelona Supercomputing Center (BSC), Spain **Prof Pascal Bouvry** ▸ CEO, LuxProvide, Luxembourg HPC Center **Prof Satoshi Matsuoka** ▸ Director, RIKEN Center for Computational Science (R-CCS), Japan **Tay Kheng Tiong** ▸ Chairman of ASEAN HPC Taskforce / CEO, A*STAR, Computational Resource Center, Singapore
17.30 – 18.10	Awarding Session **RECOGNITION OF THE TOP 10 STUDENTS AND HANDOVER OF E-CERTIFICATES** Presented by: **Dr Fabrizio Gagliardi** ▸ School Director **Wrap-up EU-ASEAN HPC School 2021 & Outlook for the future** **Dr Fabrizio Gagliardi** ▸ School Director **Dr Piyawut Srichaikul** ▸ Co-Chair of ASEAN HPC Taskforce **Aldo Dell'Ariccia** ▸ E-READI Team Leader
18.10 – 18.30	**CLOSING REMARKS** **H.E. Igor Driesmans** ▸ EU Ambassador to ASEAN **H.E. Satvinder Singh** ▸ Deputy Secretary-General of ASEAN for ASEAN Economic Community (AEC)

Zoom webinar link:
Webinar link
or ID: **875 1405 9762**

Livestream only for Panel Discussion Friday, 9th july from 16.00 - 18.30 (GMT+7):
https://www.youtube.com/c/aseansecretariatofficial
https://facebook.com/euinasean

SPEAKER PROFILES

Day 1: Monday, 5 July 2021

Opening Keynote Presentation "Service Management for the HPC Ecosystems"

Tay Kheng Tiong

Chairman of ASEAN HPC Taskforce, A*STAR, Singapore

Tay Kheng Tiong is the CEO, A*STAR Computational Resource Centre (ACRC) and the Chief Information Security Officer (CISO) for A*STAR. He is responsible for providing supercomputer services to all researchers in the whole of A*STAR across all disciplines in the physical sciences as well as the biomedical sciences. As CISO he oversees A*STAR's IT security strategy, policies and governance.

Between early 2010 and Nov 2017, Kheng Tiong was the Chief Information Officer (CIO)of Nanyang Technological University (NTU), Singapore. As NTU's CIO, Kheng Tiong was responsible for the overall IT environments covering enterprise IT, the High-Performance Computing Centre, and technology-enabled learning (TEL).

Before NTU, Kheng Tiong assumed various senior management positions in the industry including as the Vice President (Asia Pacific) of Gartner, as owner and Managing Director of an e-learning company, as the Managing Director of a start-up incubation company and as Director of HP's SOE project ($1.2 billion) on standardizing operating environment for the Singapore Government.

In education, Mr Kheng Tiong pioneered the set-up of Republic Polytechnic as the Director of the School of IT as well as Centre for Professional Development. He was also the CIO in 2 multinational corporations in Singapore for about 9 years. He served in various non-profit organizations including the Singapore Computer Society (SCS), Singapore IT Federation (SITF), the Singapore Chinese Chamber of Commerce and Industry (SCCCI) and was the president of the Singapore chapter of the IT Service Management Forum (itSMF) for 2 terms. In the course of his almost 40-year career in IT, Kheng Tiong has served as an advisor as well as a consultant to many large and small organizations mainly in Singapore and the Asia Pacific region.

Keynote Lecture "Overview of the Fugaku, Future Perspective"

Satoshi Matsuoka

Director, RIKEN Center for Computational Science (R-CCS), Japan

Satoshi Matsuoka had been a Full Professor at the Global Scientific Information and Computing Center (GSIC), the Tokyo Institute of Technology since 2001, and the director of the joint AIST-Tokyo Tech. Real World Big Data Computing Open Innovation Laboratory (RWBC-OIL) since 2017, and will become a Specially Appointed Professor at Tokyo Tech starting 2018 along with his directorship at R-CCS. He received his Ph. D. from the University of Tokyo in 1993.

He has been the leader of the TSUBAME series of supercomputers that have won many accolades such as world #1 in power-efficient computing. He also leads various major supercomputing research projects in areas such as parallel algorithms and programming, resilience, green computing, and convergence of big data/AI with HPC. He has been a major driving force behind the development of the next-generation flagship supercomputer of Japan, the supercomputer Fugaku. In June 2020 Fugaku won first place in four major rankings of supercomputer performance, Top500, HPCG, HPL-AI, and Graph500.

He has written over 500 articles according to Google Scholar and chaired numerous ACM/IEEE conferences, including the Program Chair at the ACM/IEEE Supercomputing Conference (SC13) in 2013. He is a Fellow of the ACM and European ISC, and has won many awards, including the JSPS Prize from the Japan Society for Promotion of Science in 2006, presented by his Highness Prince Akishino; the ACM Gordon Bell Prize in 2011; the Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology in 2012; the 2014 IEEE-CS Sidney Fernbach Memorial Award, the highest prestige in the field of HPC; HPDC 2018 Achievement Award from ACM; and recently SC Asia 2019 HPC Leadership Award.

Module 1 HPC System: Hardware & Software

Module 1a. Introduction to HPC Architectures and Optimization Techniques

Kentaro Sano

Team Leader of the Processor Research Team, Riken Center For Computational Science (R-CCS), Japan

Kentaro Sano has been the team leader of the processor research team at RIKEN Center for Computational Science (R-CCS) since 2017. Dr Sano is responsible for the research and development of future high-performance processors and systems. He received his PhD from GSIS, Tohoku University, in 2000. From 2000 until 2005, he was a Research Associate at Tohoku University. From 2005 until 2018, he was an Associate Professor at Tohoku University. He was a visiting researcher at the Department of Computing, Imperial College, London, and Maxeler Technology corporation in 2006 and 2007.

His research interests include data-driven and spatial-parallel processor architectures such as a coarse-grain reconfigurable array (CGRA), FPGA-based high-performance reconfigurable computing, high-level synthesis compilers and tools for reconfigurable custom computing machines, and system architectures for next-generation supercomputing based on the data-flow computing model.

Masaaki Kondo

Team Leader of the Next-Generation High-Performance Architecture Research Team, Riken Center For Computational Science (R-CCS), Japan

Masaaki Kondo is the team leader of the Next-Generation High-Performance Architecture Research Team at the Riken Center For Computational Science (R-CCS). He received his BS degree in information engineering in 1998, his MS degree in engineering from the University of Tsukuba, Japan in 2000, and his PhD degree from the University of Tokyo, Japan, in 2003. He also works at the Faculty of Science and Technology, Keio University. His research interests include computer architecture, high-performance computing, VLSI designs, artificial intelligence, and quantum computers.

Module 1b. Software of HPC System

Kento Sato

The team leader of the High-Performance Big Data Research Team, RIKEN Center for Computational Science (R-CCS), Japan

Kento Sato is a team leader at the High-Performance Big Data Research Team at the Center for Computational Science at RIKEN (RIKEN R-CCS). His research areas are distributed systems and parallel computing, particularly in High-Performance Computing (HPC). Major foci of his research are artificial intelligence, machine learning and deep learning in HPC, application reproducibility (MPI reproducibility, and Validation), scalable fault tolerance (Scalable checkpoint/restart, Fault-tolerant MPI, Resilient system design), and I/O optimization (NVRAM, Burst buffer, and Big data), co-designing and cloud computing.

He received his PhD in the Dept. of Mathematical & Computing Sciences at Tokyo Tech in 2014, his M.S. in the Dept. of Mathematical & Computing Sciences at Tokyo Tech in 2010, and his B.S. in the Dept. of Information Science at Tokyo Tech in 2008.

Module 2. Overview of the European HPC Ecosystem

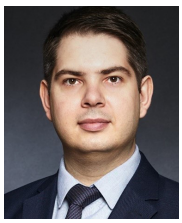
Module 2a. Outcomes of the EU-ASEAN HPC Mapping Study for ASEAN and European HPC Research Infrastructures

Sebastien Varrette

Research Scientist, Deputy Head, HPC for Research, University of Luxembourg
PRACE Advisor for Luxembourg, EU HPC Expert

Sebastien Varrette is a research scientist within the University of Luxembourg where he leads the University's HPC and Big Data facility (ULHPC) and the associated core expert team managing and operating it. In parallel, he is pursuing research in the domains of the security and performance of parallel and distributed computing platforms, such as HPC, Cloud Computing or Data Analytics infrastructures. He takes part of the management committee and represents Luxembourg within multiple EU HPC projects such as PRACE (acting Advisor), CASTIEL and ETP4HPC while acting as HPC expert for the European Commission, for instance in the Enhanced Regional EU-ASEAN Dialogue Instrument (E-READI) programme.

Module 2b. Meluxina Tutorial



Valentin Plugaru

Chief Technology Officer of LuxProvide High-Performance Computing Center

With over a decade of passion and experience in all things HPC, Valentin Plugaru has worked as part of national and European HPC initiatives, helping shape the roadmap for the European HPC ecosystem and creating Luxembourg's first national HPC centre and supercomputing platform. Today he is sharing his time among boosting LuxProvide's HPC, Data and AI capabilities, growing highly expert groups, and supporting the development of competencies networks, in particular through the EuroCC/National Competence Centers and CASTIEL projects.

Module 2c. Lumi Tutorial

Pekka Manninen

Director LUMI Leadership Computing Facility at CSC Finland

Pekka Manninen is the director of the LUMI Leadership Computing Facility. He has a long experience in HPC and HPC infrastructures and has been involved in several pan-European e-infrastructure initiatives over years. He holds a PhD in theoretical physics and is an Adjunct Professor at the University of Helsinki.

Review of School Plans and Expectations

Fabrizio Gagliardi

School Director / E-READI Senior Expert on High-Performance Computing (HPC)

Fabrizio Gagliardi, the senior strategy advisor at the Barcelona Supercomputing Centre, focuses his research interests on exploring new advanced computing technologies: AI, real-time, data management, distributed systems, cloud technology and HPC. Doctor Gagliardi graduated with a degree from the University of Pisa in 1974. He spent 30 years at CERN, in Switzerland, and 8 years at Microsoft in the US. He has held scientific positions in prestigious research organisations (CERN in CH, SLAC in the US) and consulted with scientific organisations such as FNAL and NSF in the US, INFN and GSSI in Italy, STFC in the UK. He is considered a pioneer of Grid and Cloud computing in Europe.

Aldo Dell' Ariccia

Team Leader of Enhanced Regional EU ASEAN Dialogue Instrument (E-READI)

Aldo Dell'Ariccia, an Italian citizen, is a post-graduate economist and political scientist with advanced studies in international relations at the University of Geneva in Switzerland and a specialisation in development studies in Bordeaux, France.

After a brief period as an assistant professor at the University of Geneva, he worked for the United Nations in Central America and for the Italian cooperation in Colombia. He joined the European Commission External Service in 1988 and served in India; Central America; South-East Asia; Southern Pacific and Africa.

He held the position of Deputy Head of the South East Asia Unit at the External Relations department of the European Commission in Brussels, Belgium.

In 2006 he was appointed Ambassador – Head of the European Commission Delegation to Papua New Guinea, Solomon Islands and Vanuatu, based in Port Moresby (PNG). In August 2010 he was appointed Ambassador – Head of the European Union Delegation to the Republic of Zimbabwe. In September 2014, he has been appointed acting Ambassador-Head of the European Union Delegation to the Republic of Mauritius, the Republic of Seychelles, and the Union of Comoros, and in charge of the relations with the Indian Ocean Commission, based in Port Louis, Mauritius. On 1st October 2015, he was appointed Head of the Division for Central America, Mexico, and the Caribbean at the European External Action Service, in Brussels.

After retiring from the European Foreign Service in 2018, he delivered university lectures in Italy, France, and Spain. He was a short-term observer for EU and OSCE Election Observation Missions (El Salvador, Ukraine, Kosovo).

Since 3 March 2021, he is the Team Leader of the EU-supported Enhanced Regional EU-ASEAN Dialogue Instrument (E-READI), based in Jakarta, Indonesia.

Invited Talk – Opportunities for Researcher Career Development in Europe

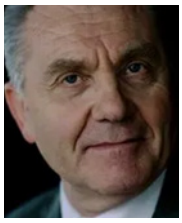
Pierrick Fillon-Ashida

Japan – ASEAN Desk Officer
European Commission Directorate-General for Research and Innovation (DG RTD)

Pierrick Fillon-Ashida works at the European Commission, Directorate-General for Research and Innovation (DG RTD), International Cooperation Affairs, in charge of the relations with Southeast Asia. He also supervises sector issues related to international affairs on infrastructure, innovation, and Information and Communication Technologies (ICT). He has been working for more than twenty years within the EU Institutions, as Head of Science and Technology (S&T) Section at the Delegation of the European Union to Japan where he was involved in international negotiation agreements, in particular about large infrastructure projects such as International Thermonuclear Experimental Reactor (ITER) on nuclear fusion.

Earlier careers at the Commission included the Directorate-General Information Society and Media (DG INFSO) in the field of health and telecom (telemedicine, mobile devices), and policy drafting on corporate governance in the telecom sector. He also worked at the Directorate-General Enterprise and Industry (DG-ENTR) (ESPRIT programme) in the field of digital libraries and corresponding large repositories bridging the gap between users, tech-providers, and policymakers.

Marie Sklodowska Curie Actions (MSCA) and European Researcher Council (ERC) Grants in Focus



Jean-Pierre Bourguignon

President, European Research Council (ERC)

Professor Jean-Pierre Bourguignon is President ad interim of the European Research Council (ERC) (from 27 July 2020 until the next ERC President is selected and takes up duties).

Previously, he was the ERC President from January 2014 until December 2019. Before that, he was the Director of the Institut des Hautes Études Scientifiques (IHÉS) from 1994 till 2013. This international research institute located near Paris, France, was built as the European counterpart of the Institute for Advanced Study in Princeton. He was also the first ERC Panel Chair in Mathematics, for Starting Grants.

A mathematician by training, he spent his whole career as a fellow of the Centre National de la Recherche Scientifique (CNRS). He held a Professor position at École Polytechnique from 1986 to 2012. From 1990 to 1992, he was President of the Société Mathématique de France and President of the European Mathematical Society from 1995 to 1998. He is a former member of the Board of the EuroScience organisation (2002-2006) and served on EuroScience Open Forum (ESOF) committees since 2004.

Professor Bourguignon received the Prix Paul Langevin in 1987 and the Prix du Rayonnement Français in Mathematical Sciences and Physics from the Académie des Sciences de Paris in 1997. He is a foreign member of the Royal Spanish Academy of Sciences. In 2005, he was elected an honorary member of the London Mathematical Society and has been the secretary of the mathematics section of the Academia Europaea. In 2008, he was made Doctor Honoris Causa of Keio University, Japan, and, in 2011, Doctor Honoris Causa of Nankai University, China. In 2017, he was elected an honorary member of the German Association of Mathematicians (DMV) and a foreign member of the Portuguese Academy of Sciences. In 2019, he was made an honorary member of the Polish Mathematical Society.

Mandate ERC Scientific Council and as ERC President: 01 Jan 2014 – 31 Dec 2019 (2nd term)

Claire Morel

Head of Unit, MSCA Under the Horizon Europe
EU Directorate-General for Education, Youth, Sport and Culture (EAC)

Claire Morel is the Head of unit in charge of the Marie Skłodowska-Curie Actions for the mobility and training of researchers and the development of excellent doctoral programmes, at the European Commission. Before that she was the Head of the Unit for international cooperation at DG Education, Culture, Youth and Sport of the European Commission, with particular focus on the international dimension of the Erasmus+ programme and international policy dialogues in higher education and youth issues with various partners of the EU in the world.

She has worked several years with the countries neighbouring the EU. Before that, she worked for the Tempus programme (for higher education modernisation), cooperating with Central Asian countries, and for the European Training Foundation, an agency of the EU based in Turin, on the reform of vocational education and training systems in the Eastern neighbouring countries and Central Asia.

EURAXESS: Your Gateway to Research in Europe

Susanne Rentzow – Vasu

Regional Project Coordinator – EURAXESS ASEAN

Susanne Rentzow-Vasu is the Regional Project Coordinator for EURAXESS ASEAN, a pan-European network that promotes borderless research cooperation and mobility between Europe and Southeast Asia. Concurrently she is the Director of her consultancy providing political analysis and reporting on EU-ASEAN relations. Before taking on her role at EURAXESS she headed the Information Centre Singapore of the German Academic Exchange Service (DAAD) as its Director from 2008 to 2012.

Susanne also held the post of Senior Policy Officer with the EU Delegation to Singapore with responsibility for the portfolios International Cooperation and Higher Education from 2003 to 2005. She holds a Master's degree in European Union Studies from the University of Newcastle (UK) and a PhD in International Relations from the University of Wales, Aberystwyth (UK).

Jenny Lind Elmaco

Chair of the SEA Chapter of the Marie Curie Alumni Association

Jenny Lind Elmaco is currently Regional Coordinator of EURAXESS for ASEAN, Chairperson of the Marie Curie Alumni Association in Southeast Asia and National Contact Point for the Marie Sklodowska Curie Actions.

Apart from Marie Curie, she was also a recipient of the Erasmus Mundus scholarship. She earned her PhD in Peace and International Development with the highest honors from the Cátedra UNESCO de Filosofía para la Paz, Universidad Jaume in Spain. She has been part of several research groups including the European Research Center for Information Systems, the Research Group on European Civil Society and Multi-level Governance at the University of Muenster, the Non-Profit Team at the Vienna School of Business and Economics and the Studies on Intermediality and Intercultural Mediation of Universidad Complutense in Madrid, among others.

She is a Global Ambassador of WomenTech Network and is a University Fellow of Wesleyan University. She received the global Marie Curie Alumni Association Social Impact Award recently for her work in peace and security, tech for good, gender and humanitarian response.

Day 2: Tuesday, 6 July 2021

Module 3. Matrix Computation

Toshiyuki Imamura

Team Leader of the Large-Scale Parallel Numerical Computing Technology Team, Riken Center For Computational Science (R-CCS), Japan

Toshiyuki Imamura is a team leader of the Large-scale Parallel Numerical Computing Technology Team at RIKEN Center for Computational Science (R-CCS), responsible for developing numerical libraries for the supercomputer Fugaku.

He received his Diploma and Doctorate in Applied Systems and Sciences both from Kyoto University in 1993 and 2000, respectively, and was a researcher at the Center for Computational Science and Engineering, Japan Atomic Energy Research Institute from 1996 to 2003, a visiting scientist at HLRS (Germany) in 2002, and an associate professor at the University of Electro-Communications from 2003 to 2012.

His research interests include high-performance computing, automatic tuning technology and parallel eigenvalue computation (algorithm/software/applications). He has been particularly committed to a long-term project to develop the high-performance eigenvalue solver EigenExa. More recently, his work has focused on mixed-precision computing and approximate computing. He has also contributed to large-scale simulations and was one of the Gordon Bell finalists in 2005, 2006, and 2020.

Invited Talk – The EuroHPC Joint Undertaking

Anders Dam Jensen

Executive Director, EuroHPC

Anders Dam Jensen has a lifelong interest in supercomputers, dating from his time in university. He started his professional career with 10 years of engineering work developing computing hardware, firmware, and software for embedded systems. He pioneered IEEE802.11 wireless network technology in the nineties while working for Symbol Technologies.

After a decade working with hardcore engineering and product development, Anders shifted into management as he joined Cargolux Airlines International as IT Director. Over the next decade, Anders was instrumental in the spin-off of the Cargolux IT department into CHAMP Cargosystems S.A. With Anders as CTO, CHAMP Cargosystems grew to become the largest supplier of IT services to the air cargo industry. In 2011, Anders was selected as the Director ICTM for the North Atlantic Treaty Organization (NATO), responsible for all Information and IT services as well as one of the largest classified networks in Europe.

In 2020, Anders was appointed as Executive Director for the European High-Performance Computing Joint Undertaking, a joint initiative between the EU, European countries and private partners to develop a World Class Supercomputing Ecosystem in Europe with a proposed budget of 8 billion EUR. Anders holds a Master of Science Degree as well as a Master of Business Administration degree from the Technical University of Denmark. He is based in Luxembourg, married to Mette, and has two children.

Module 4. HPC Programming Tools and Environment – How to make HPC Applications Scaleable

Jesus Labarta

Professor of Computer Architecture, Technical University of Catalonia (UPC)

Professor Jesús Labarta has been a full professor of Computer Architecture at UPC since 1990 and was Director of CEPBA-European Center of Parallelism at Barcelona from 1996 to 2005. Since its creation in 2005, he has been the Director of the Computer Sciences Research Department within the Barcelona Supercomputing Center (BSC).

During his 35-year academic career, Prof. Labarta has made significant contributions in programming models and performance analysis tools for parallel, multicore and accelerated systems, with the sole objective of helping application programmers to improve their understanding of their application's performance and to improve programming productivity in the transition towards very large-scale systems. His research team has been developing performance analysis and prediction tools (Paraver and Dimemas) and pioneering research on how to increase the intelligence embedded in these performance tools.

He has also been a driving force behind the task-based StarSs programming model, which gives runtime systems the required intelligence to dynamically exploit the potential parallelism and resources available. His team has influenced the evolution of the OpenMP standard with the OmpSs instantiation of StarSs, and, in particular, its tasking model.

He has constantly tried to incorporate his vision and ideas into industrial collaborations. Currently, Prof. Labarta is the leader of the Performance Optimization and Productivity (POP) EU Center of Excellence where users (both academic and SMEs) from a very wide range of application sectors receive performance assessments and suggestions for code refactoring efforts. He also leads within the EPI project the activities (hardware and software) on the RISC-V vector accelerator

In Nov 2017, he was awarded by The Association for Computing Machinery (ACM) and IEEE Computer Society (IEEE CS) with the ACM-IEEE CS Ken Kennedy Award for his seminal contributions to programming models and performance analysis tools for high-performance computing. He's the only non-US Researcher receiving this award.

Day 3: Wednesday, 7 July 2021

Module 5. Life Sciences

Module 5a. Large-scale Sequence Analysis with Alignment and Phylogenetic Trees

Sebastian Maurer-Stroh

Executive Director, Bioinformatics Institute (BII), A*STAR Singapore

Sebastian Maurer-Stroh studied theoretical biochemistry at the University of Vienna and wrote his master and PhD thesis at the Institute of Molecular Pathology (IMP). After FEBS and Marie Curie fellowships at the VIB-SWITCH lab in Brussels, he led a group of experts in protein sequence analysis as a senior principal investigator in the A*STAR Bioinformatics Institute (BII) since 2007. He is the new Executive Director of BII from January 2021. His protein function analysis skills support A*STAR's efforts at the public-private interface. Through computational analysis and modelling, his team is critically contributing to national and global viral pathogen surveillance.

Module 5b. Molecular Dynamics: Understanding structure-function-dynamics relationships

Yuji Sugita

Team Leader (PI), Laboratory for biomolecular function simulation, RIKEN Center for Biomolecular Dynamics Research, Japan

Yuji Sugita has worked at RIKEN Center for Biomolecular Dynamics Research, Japan in three concurrent roles: as the Team Leader at the Laboratory for biomolecular function simulation since 2011, the Team Leader of the Computational Biophysics Research Team since 2010, and as Chief Scientist at the Theoretical Molecular Science Laboratory since 2012.

Dr Sugita received his B. Sc. and graduate degrees in Chemistry at Kyoto University, and later his Ph. D. from Kyoto University in 1998. He has been a Postdoctoral fellow at RIKEN (1998) and has worked as a Research Associate at the Institute for Molecular Science in Japan (1998-2002). Dr Sugita was also a lecturer at the Institute of Molecular and Cellular Biosciences at the University of Tokyo (2002-2007) before returning to RIKEN as Associate Chief Scientist at the Theoretical Biochemistry Lab (2007-2012).

He has received several awards including the Young Scientist Award of the Physical Society of Japan, 2008, the Morino Science Award from Morino Foundation for Molecular Science, 2009 and the Young Scientist Award of the Molecular Simulation Society of Japan, 2009.

Chigusa Kobayashi

Technical scientist at the HPC usability development unit, RIKEN Center for Computational Science (R-CCS), Japan

Chigusa Kobayashi is a technical scientist at the HPC usability development unit, RIKEN Center for Computational Science (R-CCS), Japan. Dr Kobayashi is also a technical scientist at the Computational biophysics research team, R-CCS.

Dr Kobayashi received her B.Sc. degree in 1996 from the Chemistry department, Faculty of Science, Nagoya University, her M.Sc. in 1998 from the Graduate School of Science in Nagoya University, and her D. Sc. in 2000 from the Graduate School of Science in Nagoya University. She has worked as a postdoctoral fellow at Nagoya University, Japan (2001), University of California, San Diego, USA (2001-2003), Kobe University, Japan (2003-2006), Institute for Molecular Science, Japan (2006-2011), as a contract researcher at RIKEN Advanced Science Institute, Japan (2011-2013), and as a research scientist at R-CCS (2013-2020). She has been in her current position since 2020.

Her research interests include computer simulations of biological systems like membrane proteins and soluble proteins. She has investigated structural changes of protein and developed models and methods to understand it.

Module 6. Integrative modelling of biomolecular complexes – toward interactome modelling

Alexandre Bonvin

Scientific Director of the Bijvoet Centre for Biomolecular Research, Utrecht University

Alexandre Bonvin studied Chemistry at Lausanne University, Switzerland and obtained his PhD at Utrecht University in the Netherlands (1993). After two post-docs at Yale (USA) and the ETHZ (CH), he joined Utrecht University in 1998 where I was appointed full professor of computational structural biology in 2009. He is currently Scientific Director of the Bijvoet Centre for Biomolecular Research. His group developed and operates the HADDOCK integrative modelling platform.

Keynote Presentation – HPC for Personalized Medicine

Alfonso Valencia

Director of the Life Sciences Department, Barcelona Supercomputing Centre (BSC)

Prof. Alfonso Valencia is a biologist by training with a PhD in Biochemistry and Molecular Biology from the Universidad Autónoma de Madrid. He is an ICREA Research Professor and Director of the Life Sciences Department at the Barcelona Supercomputing Centre (BSC), Director of the Spanish National Bioinformatics Institute (INB) and head of the Spanish node of the European Bioinformatics Infrastructure ELIXIR. He is a member of the European Molecular Biology Organisation (EMBO), and former President of the International Society for Computational Biology (ISCB). He was honoured as ISCB-Fellow in 2010.

He has served in numerous Scientific Advisory Boards, including the Innovative Medicines Initiative (IMI), of which he is currently Vice-Chair, the European Molecular Biology Laboratory, the Swiss Institute for Bioinformatics, the EBI INTERPRO and chemical database, Curie Bioinformatics Unit among others. He has also been part of several evaluation committees, including the Spanish Grant Evaluation Agency (ANEP) and the European Research Council ERC. He is Co-Executive Editor of Bioinformatics, the main journal in the field of bioinformatics, and a member of the editorial boards of eLIFE, PeerJ and FEBS letters and F1000 Prime.

The main interest of his group is the study of the molecular bases of cancer and other diseases, by bringing an evolutionary perspective to the study of the interplay between genomics and epigenomics. The research is largely carried out in the context of large-scale genome projects, where new computational methods for the study of genome/phenotype relationships from ML/AI to NLP/text mining are developed. He has published more than 400 articles with an h-index of 89 (Scopus profile).

Day 4: Thursday, 8 July 2021

Module 7. Climate Simulation – Introduction to climate modelling and its uncertainty

Hirofumi Tomita

The team leader of the Computational Climate Science Research Team at RIKEN Center for Computational Science (R-CCS), Japan

Hirofumi Tomita is the team leader of the Computational Climate Science Research Team at RIKEN Center for Computational Science (R-CCS). He studied aerospace engineering at the University of Tokyo and acquired his Dr Eng. in 1999. He has researched atmospheric modelling as a researcher at the Japan Agency for Marine-Earth Science and Technology from 1999 to 2010. He has been in his current position since 2011. Until March of this year, he had also been a deputy project leader in charge of application development in the co-design of Fugaku.

His research and development interests include modelling atmospheric dynamics, cloud microphysics, and boundary layer turbulence. He is particularly interested in modelling geophysical fluid dynamics. He is one of the pioneers of high-resolution climate models. He conducted the world's first global cloud-resolving experiment, in which the behaviour of the cloud cluster with the hierarchical structure was successfully reproduced. The model construction and the above discovery lead to his high reputation. His current research interests are to study why clouds self-organize with a hierarchical structure from the perspective of energy balance in the atmosphere. Modelling using data science is a recent target.

Dale Barker

Director, Centre for Climate Research Singapore (CCRS)

As the Director of CCRS, Dr Dale Barker provides strategic direction, oversight of the centre's weather/climate science activities, and engages with senior stakeholders in the national/international weather/climate community.

Dr Barker has extensive experience in data assimilation research, use of observations in Numerical Weather Prediction (NWP), and regional climate reanalysis. He led the WRF data assimilation programme at the US National Center for Atmospheric Research (NCAR) in Boulder, Colorado (1999-2009). Between 2010 and 2018 he led the scientific development of the first EU-funded European regional reanalysis. In his previous role before joining CCRS, Dr Barker was the Associate Director for Weather Science at the Met Office, leading 200 staff working in meteorological R&D and the research-to-operational transition of global/local NWP, ocean/wave forecasting, air quality, and atmospheric dispersion systems.

Dr Barker is a Fellow of the Royal Astronomical Society (FRAS) and Royal Meteorological Society (FRMetS). He is a visiting professor at Reading University UK, an NCAR affiliate scientist, a previous member of WMO/WWRP's mesoscale weather forecasting WG, and chairs the scientific advisory committee for the new KIAPS Korean NWP system.

Invited Talk
Coupling of Numerical Weather Prediction and Regional Oceanic Models for Thailand

Kritanai TorSri
Climate and Weather Section / Hydro-Informatics Innovation Division / Hydro-Informatics Institute (HII) / Ministry of Higher Education, Science, Research and Innovation (MHESRI), Bangkok, Thailand

Kritanai Torsri works as a model developer, Senior Professional Level in Climate and Weather Section, Hydro-Informatics Innovation Division at Hydro Informatics Institute (HII), Ministry of Higher Education, Science, Research and Innovation (MHESRI), Bangkok, Thailand.

In 2014, he received a PhD scholarship granted by the Chinese Academy of Sciences-The World Academy of Sciences (CAS-TWAS) President's Fellowship Programme in Meteorology and study at the CAS-TWAS Center of Excellence for Climate and Environment Sciences & International Center for Climate and Environment Sciences (ICCES), Institute of Atmospheric Physics (IAP), CAS, Beijing, China and has completed his thesis defence in August 2020.

In 2012, he holds M.Sc. Degree in Environmental Technology granted by the Joint Graduate School of Energy and Environment (JGSEE), King Mongkut's University of Technology Thonburi (KMUTT) and, in 2002, he holds a B.Sc. Degree in Mathematics from Thaksin University, Songkhla Province that fully funds scholarship by the Ministry of University Affairs.

His research interests focus on numerical weather predictions, sub-seasonal to seasonal forecast (S2S), seasonal to interannual climate variabilities and extremes.

Invited Talk
The Operational Wave Forecasting System for the Gulf of Thailand

Watin Thanathanphon
Hydro-Informatics Institute (HII)

Watin Thanathanphon obtained a master's degree in Technology of Environmental Management from Mahidol University, Thailand. He is currently a model developer of the Hydroinformatics modelling system section of Hydro Informatics Institute (HII) under The Ministry of Higher Education, Science, Research, and Innovation (MHESI), Thailand.

His area of expertise is data and information for the operational management system. He has developed the decision support system (DSS) for flood forecasting and water management cover almost entire major river basins in Thailand that integrate real-time monitoring data, forecasting data and flood forecast models. He also has experience in the development of a wave forecasting system for the Gulf of Thailand using the SWAN wave model, which runs operationally at high performance computing cluster.

Module 8. Climate & Air Quality Modelling

Module 8a. Introduction to Earth Science Fundamentals and Modelling

Raffaele Bernardello

Researcher, Climate Prediction Group at the Earth Sciences Department, Barcelona Supercomputing Center (BSC)

Raffaele Bernardello is an established researcher in the Climate Prediction Group at the Earth Sciences Department (BSC) where he coordinates activities related to the global carbon cycle and ocean biogeochemistry. Raffaele received his PhD in Marine Sciences from the Technical University of Catalonia in 2010. He then spent six years as a postdoctoral researcher between the University of Pennsylvania (USA) and the National Oceanography Centre, Southampton (UK).

In 2017 he joined BSC where he started a new research line in seasonal-to-decadal predictions of the global carbon cycle and ocean biogeochemistry. Raffaele's research interests are in the global carbon cycle and its interactions with climate variability and change.

Module 8b. Introduction to Atmospheric Chemistry Fundamentals and Modelling

Oriol Jorba

Group leader of the Atmospheric Composition Group at the Earth Sciences Department of the Barcelona Supercomputing Center (BSC)

Oriol Jorba is a group leader of the Atmospheric Composition Group at the Earth Sciences Department of the Barcelona Supercomputing Center (BSC). He received a PhD in Environmental Engineering from the Technical University of Catalonia in 2005. He was enrolled as a researcher at BSC in 2005 and held a research position at the University of California Irvine (USA) in 2011 and the NASA Goddard Institute for Space Studies (USA) in 2013.

His research interests are in the chemical processes controlling atmospheric aerosols and trace gases, and their impact on air quality and health. He has led several model developments at BSC. He conceived the forecasting system CALLIOPE and its urban component which provides air quality predictions for Spain and Barcelona at high resolution and leads the development of the multiscale chemical weather forecasting system MONARCH which is the official model used by the World Meteorological Organisation.

Day 5: Friday, 9 July 2021

Module 9. Urgent Computing on Natural Hazard, Urban Vulnerability and Natural Disaster Risk

Module 9a. Automatic Construction of Three-Dimensional Group Model by using Data Processing Platform

Tomohide Takeyama

Associate Professor with Department of Civil Engineering, Kobe University, Japan
Visiting Researcher, Disaster Risk Computational Disaster Mitigation and Reduction Research Team, R-CCS, Japan

Tomohide Takeyama graduated from the School of Science and Engineering from Tokyo Institute of Technology. He acquired his Masters in Engineering (M.Eng) from the Department of Civil Engineering in 2004, and his Doctorate Degree D.Eng in 2007 from the Department of International Development Engineering. He was then an Assistant Professor with the Department of International Development, Tokyo Institute of Technology for two years. He was a Researcher with National Institute for Land and Infrastructure Management from 2009 – 2010. He then returned to Tokyo Institute of Technology and took the role of an Assistant Professor with the Department of Civil Engineering from 2010 to 2015 before moving to the current position with Kobe University.

Module 9b. High Fidelity 3D Tsunami Inundation Simulation and its Application to Disaster Mitigation Education using VR and AR

Mitsuteru Asai

Associate Professor, Department of Civil Engineering, Kyushu University, Japan

Mitsuteru Asai has been affiliated with the Department of Civil Engineering, Kyushu University for over 15 years. In 2005, he was an assistant professor at Ritsumeikan University for the Department of Micro-Electrical-Mechanical System. Apart from these, he had been a postdoctoral fellow at Ohio State University for the Department of Mechanical Engineering. Dr Asai received his PhD and Masters from Tohoku University, Department of Civil Engineering.

Module 9c. Debris Flow Simulation for Rapid Damage Detection Employing Machine Learning

Kazuki Yamanoi

Assistant Professor, Disaster Prevention Research Institute, Kyoto University, Japan Visiting Researcher, Disaster Risk Computational Disaster Mitigation and Reduction Research Team, RIKEN Center for Computational Science (R-CCS), Japan

Kazuki Yamanoi received the M.Eng. and PhD degrees from the Department of Civil and Earth Resources Engineering, Graduate School of Engineering, Kyoto University, Kyoto, Japan in 2014 and 2017, respectively. From 2015 to 2017, he was a Research Fellow with the Japan Society for the Promotion of Science and the Disaster Prevention Research Institute, Kyoto University. He was a Postdoctoral Researcher with the RIKEN Center for Computational Science (R-CCS), Kobe, Japan, in 2018. He has been an Assistant Professor with the Research Center for Fluvial and Coastal Disasters, Disaster Prevention Research Institute, Kyoto University, since 2019, and also a Visiting Researcher with R-CCS. His research interest includes simulation on the multiple hazards of water-related disasters, such as debris flow, landslides, sediment transport, and urban inundation.

Satoru Oishi

Team Leader of the Computational Disaster Mitigation and Reduction Research Team, RIKEN Center for Computational Science (R-CCS), Japan

Satoru Oishi, a doctor of Engineering, is a professor of the Research Center for Urban Safety and Security at KOBE University. He is also a Team Leader of the Computational Disaster Mitigation and Reduction Research Team, RIKEN Center for Computational Science (R-CCS).

Dr Oishi has conducted disaster-related research for more than 25 years. From 1993 to 1999, he was a research associate at the Disaster Prevention Research Institute, Kyoto University. From 2000 to 2009, he was an associate professor at the University of Yamanashi studying river engineering and sabo engineering. He also conducted many studies abroad under the CREST.

Since 2009, he has been a professor at Kobe University. He mainly focuses on the application of remote sensing techniques to disaster prevention. As a team leader of RIKEN R-CCS, he works on promoting high-performance computing simulations of disasters including earthquake, tsunami and weather-related disasters.

Keynote Speaker

Dwikorita Karnawati

Head of Indonesia's Agency for Meteorology, Climatology and Geophysics (BMKG); Geology Professor of the University of Gadjah Mada, Indonesia

Dwikorita Karnawati (Rita) PhD, has been the Head of Indonesia's Agency for Meteorology, Climatology and Geophysics (BMKG), since November 2017, after her completion in serving as the President of Universitas Gadjah Mada (UGM), a prominent university with 55,000 students in Indonesia. She has extensive professional experience and comprehensive academic background. As Professor in Environmental Geology and Disaster Mitigation at UGM, she is very active in promoting and developing the National Multi-Hazard Early Warning System (MHEWS), and very well-respected as one of the key figures in the preparation of the Presidential Decree on the Indonesian Tsunami Early Warning System (InaTEWS) (Presidential Decree, Number 93 of 2019).

In her recent position as the Head of the Agency, she actively drives innovation on Early Warning Technology and Impact-based Forecasting Systems for Meteorology, Climatology and Geophysics, powered by the Big Data, Artificial Intelligent (AI), and Internet of Things (IoT), which is also connected to Social Media, Mobile Apps and YouTube. She also actively promotes the Community Awareness Program on Climate Adaptation through Climate Field School for fisheries and farmers, which are considered as the most vulnerable communities during this Covid-19 pandemic. Furthermore, she facilitates the Development and Implementation of the Coastal Flood Inundation System to reduce the risk of socio-economic loss in the coastal area in Jakarta Bay. Now she plays a strong leadership role in Modernizing and Strengthening the National Marine – Atmospheric Observations and Forecasting System across the Indonesian Maritime Region, to support the improvement of maritime economic development and resiliency in the country.

Keynote Speaker – Quantum Supercomputers

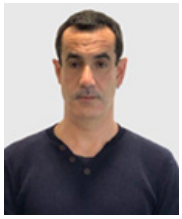
José Ignacio Latorre

Director, Centre for Quantum Technologies
Provost's Chair Professor, Department of Physics, National University of Singapore

José Ignacio Latorre is the Director of the Center for Quantum Technologies in Singapore, and the Chief Research of the Quantum Research Centre in the Technology Innovation Institute in Abu Dhabi. He got his PhD in elementary particle physics and has worked extensively in quantum information and artificial intelligence. His outreach activity includes the writing of three popular books and the production of two documentaries. He has also created Qillimanjaro Quantum Tech, a company that is constructing the first quantum computer in the South of Europe.

Module 10. Urgent Computing for Natural Disasters

Module 10a. ChEESE Center of Excellence
Module 10d. Operational Forecast of Volcanic Ash Clouds



Arnau Folch

Senior researcher at the CASE Department of the Barcelona Supercomputing Center (BSC)

With a degree in Physics and PhD in Applied Maths, Dr Folch leads the Environmental Simulations research group and the Center of Excellence for Exascale in Solid Earth (ChEESE). His professional experience covers project management and execution, PhD supervision, the editorial board of scientific journals and convening multiple sessions in international meetings. Since 2011 he has acted as liaison officer of the International Union of Geophysics and Geodesy (IUGG) at the World Meteorological Organization (WMO) and leads the Commission on Tephra Hazard Modelling of the International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI).

He has wide expertise in ash dispersal forecasting and is one of the developers of the numerical model for ash transport FALL3D, widely used worldwide. He is also a permanent member of the Volcanic Ash Scientific Advisory Group (VASAG) of the IUGG-WMO. Having access to some of the most powerful supercomputing facilities in Europe he has also developed wide expertise in optimized computing strategies.

Module 10b. Faster Than Real-Time (FTRT) Tsunami Simulations

Jorge Macías

Professor, Málaga University

Macías obtained his degree in Mathematics from the University of Málaga (UMA) in 1991, and a scholarship of the Spanish Institute of Oceanography (IEO) between 1991 and 1994 on the subject of Mathematical Modeling and Numerical Simulation in Oceanography. He completed his doctorate at the UMA and the Diplôme d'Etudes Approfondies (D.E.A.) at the Université Paris VI (France) and the associated stage at the Laboratoire d'Océanographie Dynamique et de Climatologie (LODYC) also at Paris VI. Dr Macías completed his Doctoral Thesis at the Center Européen de Recherche et Formation Advancée at Calcul Scientifique (CERFACS) in Toulouse, on hybrid ocean-atmosphere coupled models.

He obtained his PhD degree in Mathematics from the UMA in September 1998 and from the University P. et M. Curie of Paris (label européen) in the speciality of Numerical Analysis in November 1998. He has been an associate professor in the Department of Mathematical Analysis of the UMA since 1995 and a professor in the same department in the area of Applied Mathematics since 2001. He belongs to the research group of Differential Equations, Numerical Analysis and Applications (EDANYA) of the UMA whose main interests focused on the Mathematical Modeling and Numerical Simulation of Geophysical Flows and the development of of of numerical schemes and their efficient implementation. In recent years he has focused his research on numerical simulation of tsunamis in topics such as FTRT simulations, PTF and PTHA implementing codes in GPUs and using HPC infrastructures.

Module 10c. Urgent Computing for Earthquakes

Josep de la Puente

Team Leader, BSC, Spain
Manager of the Geoscience Applications Group at the Barcelona Supercomputing Center (BSC)

Josep de la Puente is the Manager of the Geoscience Applications Group at BSC. He holds a B.Sc. in Physics from the University of Barcelona and PhD in Natural Sciences from the Ludwig-Maximilians University (LMU) of Munich. He has broad experience in the simulation and inversion of waves for geophysical applications using supercomputers. His expertise in high-performance applications and geophysical software development has led to participating in several projects related to technology transfer both of public-competitive and industrial nature. He has also been awarded 6 academic projects, national and international, of which he is the High-Performance of the principal investigator. He is the author of 30+ scientific articles and 100+ scientific conference talks. Presently, he manages a multi-disciplinary team including engineers, mathematicians and physicists focusing on HPC applications for geosciences. He is active in research areas including seismology, geothermal energy and medical imaging. He is currently a member of the PRACE Access Committee.

Friday, 9 July 2021 at 16.00-18.30 (GMT+7)

Future of High-Performance Computing (HPC)

Panel Discussion – Public Event

Held through Zoom Webinar Platform

Overview

A virtual panel discussion about the future of high-performance computing (HPC) and its current trends, will conclude the school on 9 July 2021. Prestigious scientists, responsible for the design of some of the top supercomputers in the world, and pioneers of new HPC technology, such as quantum technology, will debate the current trends to overcome the Moore Law limit and explore the future of HPC and its applications.

Moderator

Anders Dam Jensen

Executive Director, EuroHPC

Anders Dam Jensen has a lifelong interest in supercomputers, dating from his time in university. He started his professional career with 10 years of engineering work developing computing hardware, firmware, and software for embedded systems. He pioneered IEEE802.11 wireless network technology in the nineties while working for Symbol Technologies.

After a decade working with hardcore engineering and product development, Anders shifted into management as he joined Cargolux Airlines International as IT Director. Over the next decade, Anders was instrumental in the spin-off of the Cargolux IT department into CHAMP Cargosystems S.A. With Anders as CTO, CHAMP Cargosystems grew to become the largest supplier of IT services to the air cargo industry. In 2011, Anders was selected as the Director ICTM for the North Atlantic Treaty Organization (NATO), responsible for all Information and IT services as well as one of the largest classified networks in Europe.

In 2020, Anders was appointed as Executive Director for the European High Performance Computing Joint Undertaking, a joint initiative between the EU, European countries and private partners to develop a World Class Supercomputing Ecosystem in Europe with a proposed budget of 8 billion EUR. Anders holds a Master of Science Degree as well as a Master of Business Administration degree from Technical University of Denmark. He is based in Luxembourg, married to Mette, and has two children.

Invited panellists

Dwikorita Karnawati

Head of BMKG Indonesia, Geology Professor of the University of Gadjah Mada

Dwikorita Karnawati (Rita) PhD, has been the Head of Indonesia's Agency for Meteorology, Climatology and Geophysics (BMKG), since November 2017, after her completion in serving as the President of Universitas Gadjah Mada (UGM), a prominent university with 55,000 students in Indonesia.

She has extensive professional experience and comprehensive academic background. As Professor in Environmental Geology and Disaster Mitigation at UGM, she is very active in promoting and developing the National Multi-Hazard Early Warning System (MHEWS), and very well-respected as one of the key figures in the preparation of the Presidential Decree on the Indonesian Tsunami Early Warning System (InaTEWS) (Presidential Decree, Number 93 of 2019).

In her recent position as the Head of the Agency, she actively drives innovation on Early Warning Technology and Impact-based Forecasting Systems for Meteorology, Climatology and Geophysics, powered by the Big Data, Artificial Intelligent (AI), and Internet of Things (IoT), which is also connected to Social Media, Mobile Apps and YouTube. She also actively promotes the Community Awareness Program on Climate Adaptation through Climate Field School for fisheries and farmers, which are considered as the most vulnerable communities during this Covid-19 pandemic. Furthermore, she facilitates the Development and Implementation of the Coastal Flood Inundation System to reduce the risk of socio-economical loss in the coastal area in Jakarta Bay. Now she plays a strong leadership role in Modernizing and Strengthening the National Marine – Atmospheric Observations and Forecasting System across the Indonesian Maritime Region, to support the improvement of maritime economic development and resiliency in the country.

José Ignacio Latorre

Director, Centre for Quantum Technologies
Provost's Chair Professor, Department of Physics, National University of Singapore

Head of the Singapore Quantum Institute, a world leader in quantum computing.

Professor José Ignacio Latorre is the Director of the Center for Quantum Technologies in Singapore, and the Chief Research of the Quantum Research Centre in the Technology Innovation Institute in Abu Dhabi. He got his PhD in elementary particle physics and has worked extensively in quantum information and artificial intelligence. His outreach activity includes the writing of three popular books and the production of two documentaries. He has also created Qillimanjaro Quantum Tech, a company that is constructing the first quantum computer in the South of Europe.

Kimmo Koski

CEO, CSC – IT Centre for Science, Finland

Responsible for the LUMI Supercomputer

Kimmo Koski started at CSC in August 2004 with a mission to support Finnish research providing world-class e-infrastructure and related services. This includes investments in national resources and active participation in European initiatives. One example is the eco-efficient data centre in a former paper mill in Kajaani hosting the LUMI EuroHPC pre-exascale system.

During recent years, Koski has been involved in various European collaborations in high-performance computing, data management, networks and cloud activities. He has been active in building European HPC and data infrastructure through involvement in major EU initiatives, such as EuroHPC, EUDAT, EOSC and PRACE.

Mateo Valero

Director, Barcelona Supercomputing Centre

A veteran of HPC computing architecture and promoter of a new open-source hardware approach to supercomputing;

Mateo Valero, http://www.bsc.es/cv-mateo/, obtained his Telecommunication Engineering Degree from the Technical University of Madrid (UPM) in 1974 and his PhD in Telecommunications from the Technical University of Catalonia (UPC) in 1980. He is a professor in the Computer Architecture Department at the Polytechnic University of Catalonia (UPC), in Barcelona. His research interests focus on high-performance architectures. He has published approximately 700 papers, has served in the organization of more than 300 International Conferences and has given more than 500 invited talks. He is the director of the Barcelona Supercomputing Centre, the National Centre of Supercomputing in Spain.

Dr Valero has been honoured with several awards. Among them, the Eckert-Mauchly Award 2007 by the IEEE and ACM; Seymour Cray Award 2015 by IEEE; Charles Babbage 2017 by IEEE; Harry Goode Award 2009 by IEEE: ACM Distinguished Service Award 2012; Euro-Par Achievement Award 2015; the Spanish National Julio Rey Pastor award, in recognition of research in Mathematics; the Spanish National Award "Leonardo Torres Quevedo" that recognizes research in engineering; the "King Jaime I" in basic research given by Generalitat Valenciana; the Research Award by the Catalan Foundation for Research and Innovation and the "Aragón Award" 2008 given by the Government of Aragón. He has been named Honorary Doctor by the Universities of Chalmers, Belgrade, Las Palmas de Gran Canaria, Zaragoza, Complutense de Madrid, Cantabria,,Granada and the University of Veracruz and CINVESTAV in Mexico. "Hall of the Fame" member of the ICT European Program (selected as one of the 25 most influential European researchers in IT during the period 1983-2008. Lyon, November 2008); Honoured with Creu de Sant Jordi 2016 by Generalitat de Catalunya. It is the highest recognition granted by the Government. Honoured with "Condecoración de la Orden Mexicana del Águila Azteca" 2018, the highest recognition granted by the Mexican Government.

In 2020, Mateo was recognised with the Outstanding Leadership in HPC award in the HPCWire Readers' Choice Awards for "being an HPC pioneer since 1990 and the driving force behind the renaissance of European HPC independence". In December 1994, Professor Valero became a founding member of the Royal Spanish Academy of Engineering. In 2005 he was elected Correspondent Academic of the Spanish Royal Academy of Science, in 2006 member of the Royal Spanish Academy of Doctors, in 2008 member of the Academia Europaea and 2012 Correspondent Academic of the Mexican Academy of Sciences. In 2018, he was elected academic for the Gastronomy Academy in Murcia, Honorary academic of the European Royal Academy of Doctors and Correspondent academic by the Engineering Academy in Mexico. He is a Fellow of the IEEE, a Fellow of the ACM and an Intel Distinguished Research Fellow. In 1998 he won a "Favourite Son" Award of his home town, Alfamén (Zaragoza) and in 2006, his native town of Alfamén named their Public College after him.

Pascal Bouvry

CEO of Luxprovide SA

Luxembourg HPC Center, hosting the MeluXina petascale system;

Pascal Bouvry holds a PhD degree in computer science from the University of Grenoble (INPG), France, and performed post-doctoral research at CWI in Amsterdam. He gained industrial experience working in various management and C-Level positions in Europe, Asia and North America in the Fintech, Space, and Telecommunication domains. Since 2003 Pascal has served as a full professor at the University of Luxembourg, for which he founded and manages the HPC service. Pascal Bouvry is CEO of Luxprovide SA, the Luxembourg national HPC centre as part of EURO-HPC, also represents Luxembourg in the PRACE council, and serves as an associated editor for IEEE, Springer and Elsevier.

Satoshi Matsuoka

Director, RIKEN R-CCS (Center for Computational Science), Japan

A mastermind behind the number one supercomputer in the world, Fugaku;

Satoshi Matsuoka had been a Full Professor at the Global Scientific Information and Computing Center (GSIC), the Tokyo Institute of Technology since 2001, and the director of the joint AIST-Tokyo Tech. Real World Big Data Computing Open Innovation Laboratory (RWBC-OIL) since 2017, and will become a Specially Appointed Professor at Tokyo

Tech starting 2018 along with his directorship at R-CCS. He received his Ph. D. from the University of Tokyo in 1993. He has been the leader of the TSUBAME series of supercomputers that have won many accolades such as world #1 in power-efficient computing. He also leads various major supercomputing research projects in areas such as parallel algorithms and programming,

resilience, green computing, and convergence of big data/AI with HPC. He has been a major driving force behind the development of the next-generation flagship supercomputer of Japan, the supercomputer Fugaku. In June 2020 Fugaku won first place in four major rankings of supercomputer performance, Top500, HPCG, HPL-AI, and Graph500. He has written over 500

articles according to Google Scholar, and chaired numerous ACM/IEEE conferences, including the Program Chair at the ACM/IEEE Supercomputing Conference (SC13) in 2013. He is a Fellow of the ACM and European ISC, and has won many awards, including the JSPS Prize from the Japan Society for Promotion of Science in 2006, presented by his Highness Prince Akishino; the ACM Gordon Bell Prize in 2011; the Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology in 2012; the 2014 IEEE-CS Sidney Fernbach Memorial Award, the highest prestige in the field of HPC; HPDC 2018 Achievement Award from ACM; and recently SC Asia 2019 HPC Leadership Award.

Tay Kheng Tiong

Chairman of ASEAN HPC Taskforce
CEO, A*STAR (Computational Resource Centre), Singapore

Author of the Supercomputing @ Your Fingertips (SC@FT) model and architect of the HPC ASEAN shared platform;

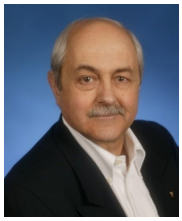
Tay Kheng Tiong is the CEO, A*STAR Computational Resource Centre (ACRC) and the Chief Information Security Officer (CISO) for A*STAR. He is responsible for providing supercomputer services to all researchers in the whole of A*STAR across all disciplines in the physical sciences as well as the biomedical sciences. As CISO he oversees A*STAR's IT security strategy, policies and governance.

Between early 2010 and Nov 2017, Kheng Tiong was the Chief Information Officer (CIO) of Nanyang Technological University (NTU), Singapore. As NTU's CIO, Kheng Tiong was responsible for the overall IT environments covering enterprise IT, the High-Performance Computing Centre, and technology-enabled learning (TEL). Before NTU, Kheng Tiong assumed various senior management positions in the industry including as the Vice President (Asia Pacific) of Gartner, as owner and Managing Director of an e-learning company, as the Managing Director of a start-up incubation company and as Director of HP's SOE project ($1.2 billion) on standardizing operating environment for the Singapore Government.

In education, Mr Kheng Tiong pioneered the set-up of Republic Polytechnic as the Director of the School of IT as well as Centre for Professional Development. He was also the CIO in 2 multinational corporations in Singapore for about 9 years. He served in various non-profit organizations including the Singapore Computer Society (SCS), Singapore IT Federation (SITF), the Singapore Chinese Chamber of Commerce and Industry (SCCCI) and was the president of the Singapore chapter of the IT Service Management Forum (itSMF) for 2 terms. In the course of his an almost 40-year career in IT, Kheng Tiong has served as an advisor as well as a consultant to many large and small organizations mainly in Singapore and the Asia Pacific region.

SCHOOL COORDINATORS

DIRECTOR



Fabrizio Gagliardi

E-READI Senior Expert on High Performance Computing (HPC)

Fabrizio Gagliardi, the senior strategy advisor at the Barcelona Supercomputing Centre, focuses his research interests on exploring new advanced computing technologies: AI, real-time, data management, distributed systems, cloud technology and HPC. Doctor Gagliardi graduated with a degree from the University of Pisa in 1974. He spent 30 years at CERN, in Switzerland, and 8 years at Microsoft in the US. He has held scientific positions in prestigious research organisations (CERN in CH, SLAC in the US) and consulted with scientific organisations such as FNAL and NSF in the US, INFN and GSSI in Italy, STFC in the UK. He is considered a pioneer of Grid and Cloud computing in Europe.

SCHOOL COMMITTEE

Piyawut (Joe) Srichaikul

Co-Chair, ASEAN HPC Task Force

Dr Piyawut (Joe) Srichaikul is a principal researcher at the National Electronics and Computer Technology Center (NECTEC), a member of the National Science and Technology Development Agency (NSTDA), Thailand. He joined NECTEC in 1995 where he built up his multi-disciplinary experience, which includes Computational Science, High-Performance Computing, Geo-informatics, Data Analytics, Research Program Management, and Organization Management. Currently, he acts as a Chief Executive of NSTDA Supercomputer Center (ThaiSC), a newly founded unit in 2019 with a mission of being one of the National S&T Infrastructures under NSTDA. He also serves as a Co-Chair of the ASEAN HPC Task Force.

Joe holds a BSc degree in Physics from Chulalongkorn University, Thailand, and a PhD (Solid State Physics) from Auburn University, USA.

J.W. Saputro

Indonesia HPC Task Force

After completing his PhD at the University of Wisconsin – Madison, Dr Saputro taught mainly in the US as well as in other countries including Canada, Brazil, Malaysia, and Indonesia. His interests include business process automation, e-Government, and Big Data. After 21 years living in the US, and, he has been spending more time in his home country Indonesia for the past few years.

Among other things, he helped establish the Indonesian Science Fund and was subsequently appointed as its first Executive Director. He is currently a senior advisor for green infrastructure development in Indonesia and is also actively involved in the ASEAN HPC Task Force.

Putchong Uthayopas

Head of Department of Computer Engineering, Faculty of Engineering, Kasetsart University, Thailand

Putchong Uthayopas got his bachelor and master degree in electrical engineering from Chulalongkorn University in 1984 and 1988 accordingly. He also got a master and PhD in computer engineering from the University of Louisiana in 1994 and 1996. His research interest is in cluster computing, grid and cloud computing systems and tools. He published more than 130 refereed publications in conferences and Journals. Putchong Uthayopas was a co-founder of the Thai National Grid Project in 2005. Dr Putchong is also the President of Computational Science and Engineering from 2013-2015. In 2012, he received Pethe distinguished computer engineer award in system integration from the Engineering Institute of Thailand.

MODULE COORDINATORS

Kengo Nakajima

Deputy Director, RIKEN R-CCS / Professor, The University of Tokyo

Kengo Nakajima has been a Professor in the Supercomputing Research Division, Information Technology Center, at the University of Tokyo since 2008. Before joining the University of Tokyo in 2004, he spent 19 years in the industry. He has also been the Deputy Director of RIKEN R-CCS (Center for Computational Science) since 2018. His research interest covers computational mechanics, computational fluid dynamics (CFD), numerical linear algebra, parallel iterative algorithms, parallel preconditioning methods, multigrid methods, parallel programming models, adaptive mesh refinement (AMR), and parallel visualization. B.Eng (1985, Aeronautics, University of Tokyo), M.S. (1993, Aerospace Engineering, the University of Texas at Austin), PhD (2003, Engineering Mechanics, University of Tokyo).

Pascal Bouvry

CEO of Luxprovide SA

Prof. Pascal Bouvry holds a PhD degree in computer science from the University of Grenoble (INPG), France, and performed post-doctoral research at CWI in Amsterdam. He gained industrial experience working in various management and C-Level positions in Europe, Asia and North America in the Fintech, Space, and Telecommunication domains. Since 2003 Pascal has served as a full professor at the University of Luxembourg, for which he founded and manages the HPC service. Pascal Bouvry is CEO of Luxprovide SA, the Luxembourg national HPC centre as part of EURO-HPC, also represents Luxembourg in the PRACE council, and serves as an associated editor for IEEE, Springer and Elsevier.

Rossen Apostolov

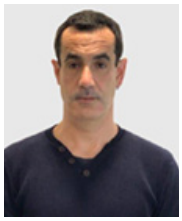
Executive Director, BioExcel Centre of Excellence for Computational Biomolecular Research, PDC Centre for High-Performance Computing, KTH Royal Institute of Technology, Stockholm, Sweden

Dr Rossen Apostolov holds a PhD in Computational Chemistry from Osaka University. He is Executive Director of the BioExcel Center of Excellence for Computational Biomolecular Research, PDC Centre for High-Performance Computing KTH Royal Institute of Technology, Stockholm, Sweden. Previously he served as Technical Director of the ScalaLife project. He is a member of the steering committee of CodeRefineryPerformance and a member of the Software Carpentry Council. His interests include computational biomolecular research, extreme-scale computing, accelerators, as well as modern best practices for software development.

Francisco Doblas Reyes

Director of the Earth Sciences Department at Barcelona Supercomputing Center (BSC)

Francisco Javier Doblas-Reyes is the Director of the Earth Sciences Department at Barcelona Supercomputing Center-Centro Nacional de Supercomputación (BSC-CNS). The Department hosts more than 100 engineers, physicists, mathematicians and social scientists who try to bring the latest developments in supercomputing and data analysis to provide the best information and services on climate and air quality. He is the author of more than 190 peer-reviewed papers, a member of several panels of the World Meteorological Organization and lead author of the Fifth and Sixth Assessment Reports of the Intergovernmental Panel on Climate Change.



Arnau Folch

Senior researcher at the CASE Department of the Barcelona Supercomputing Center (BSC)

With a degree in Physics and PhD in Applied Maths, Dr Folch leads the Environmental Simulations research group and the Center of Excellence for Exascale in Solid Earth (ChEESE). His professional experience covers project management and execution, PhD supervision, the editorial board of scientific journals and convening multiple sessions in international meetings. Since 2011 he has acted as liaison officer of the International Union of Geophysics and Geodesy (IUGG) at the World Meteorological Organization (WMO) and leads the Commission on Tephra Hazard Modelling of the International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI). He has wide expertise in ash dispersal forecasting and is one of the developers of the numerical model for ash transport FALL3D, widely used worldwide. He is also a permanent member of the Volcanic Ash Scientific Advisory Group (VASAG) of the IUGG-WMO. Having access to some of the most powerful supercomputing facilities in Europe he has also developed wide expertise in optimized computing strategies.