

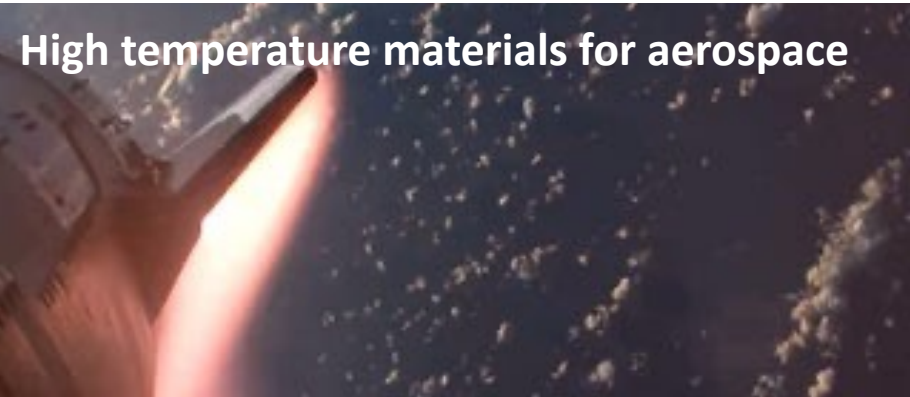
Returning Mentor Career Lightning Talks

Aly
Badran

**INTERNATIONAL HPC SUMMER SCHOOL
2024**

Kobe, Japan – 7-12 July, 2024





Aly Badran



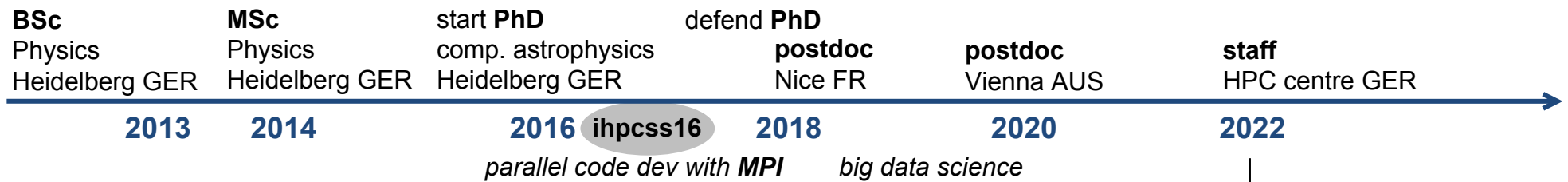
Returning Mentor Career Lightning Talks

Jolanta
Zjupa

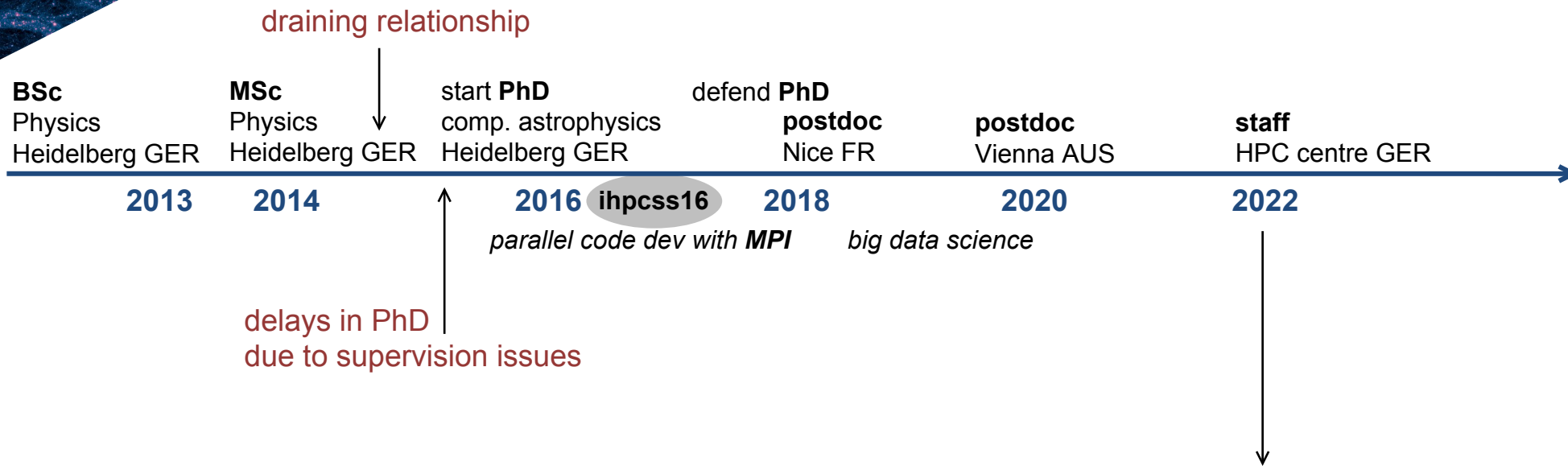
**INTERNATIONAL HPC SUMMER SCHOOL
2024**

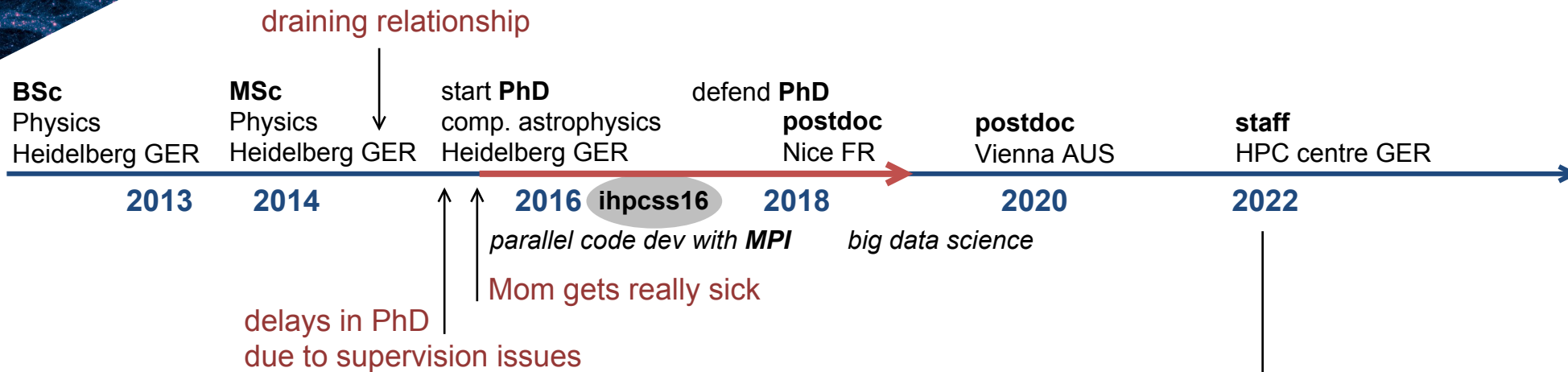
Kobe, Japan – 7-12 July, 2024



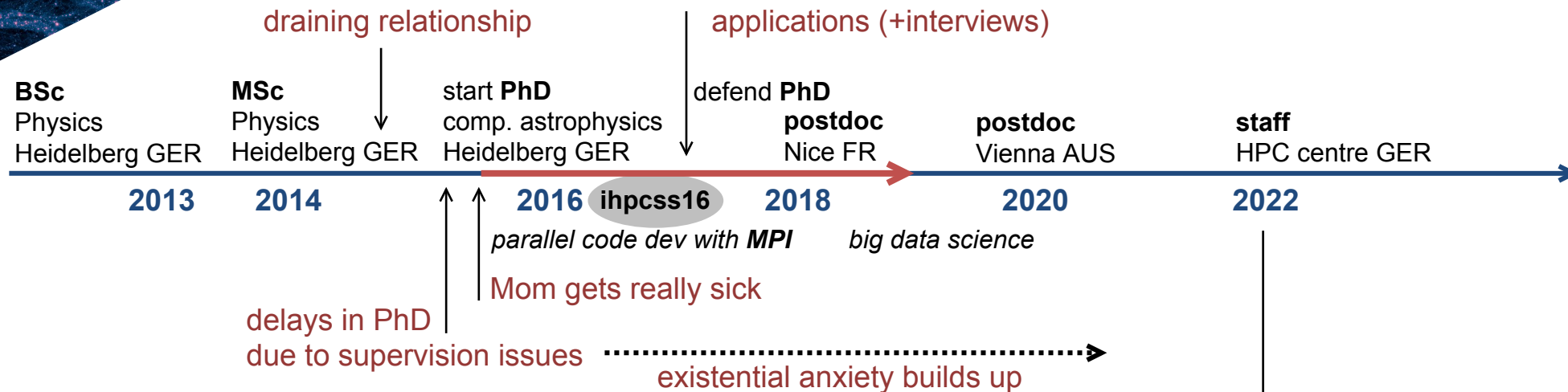


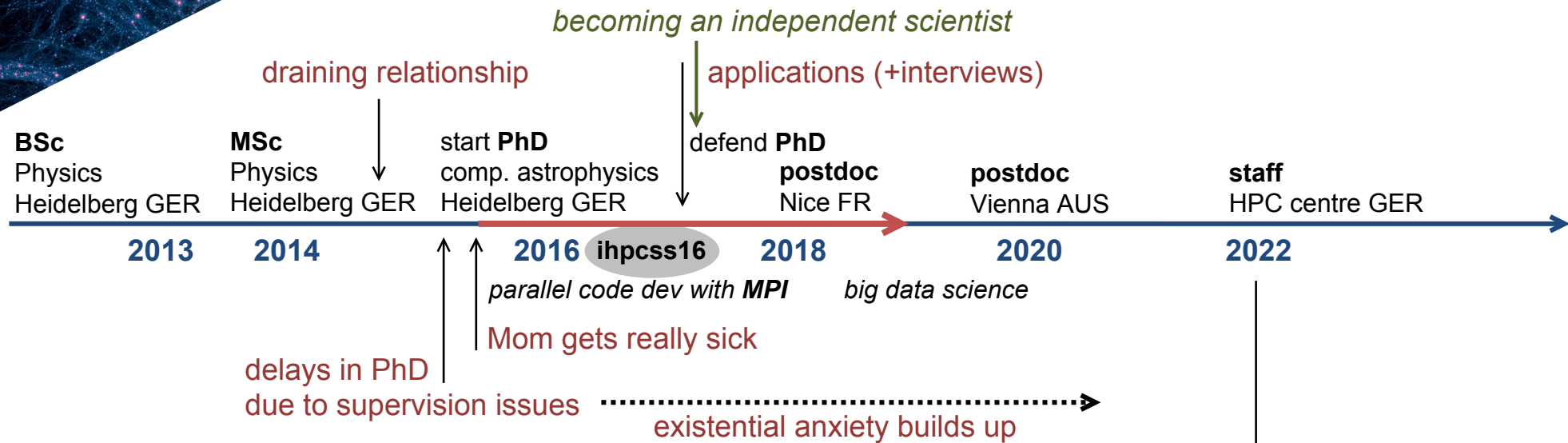
Jolanta Zjupa

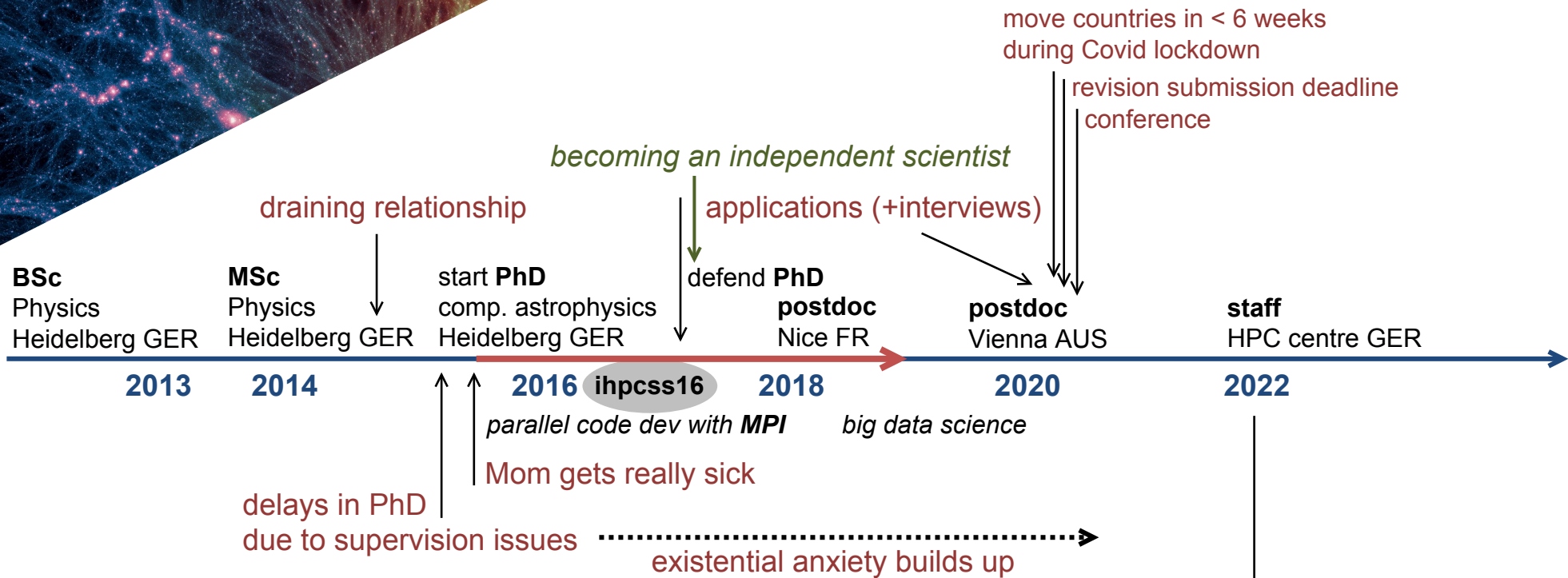


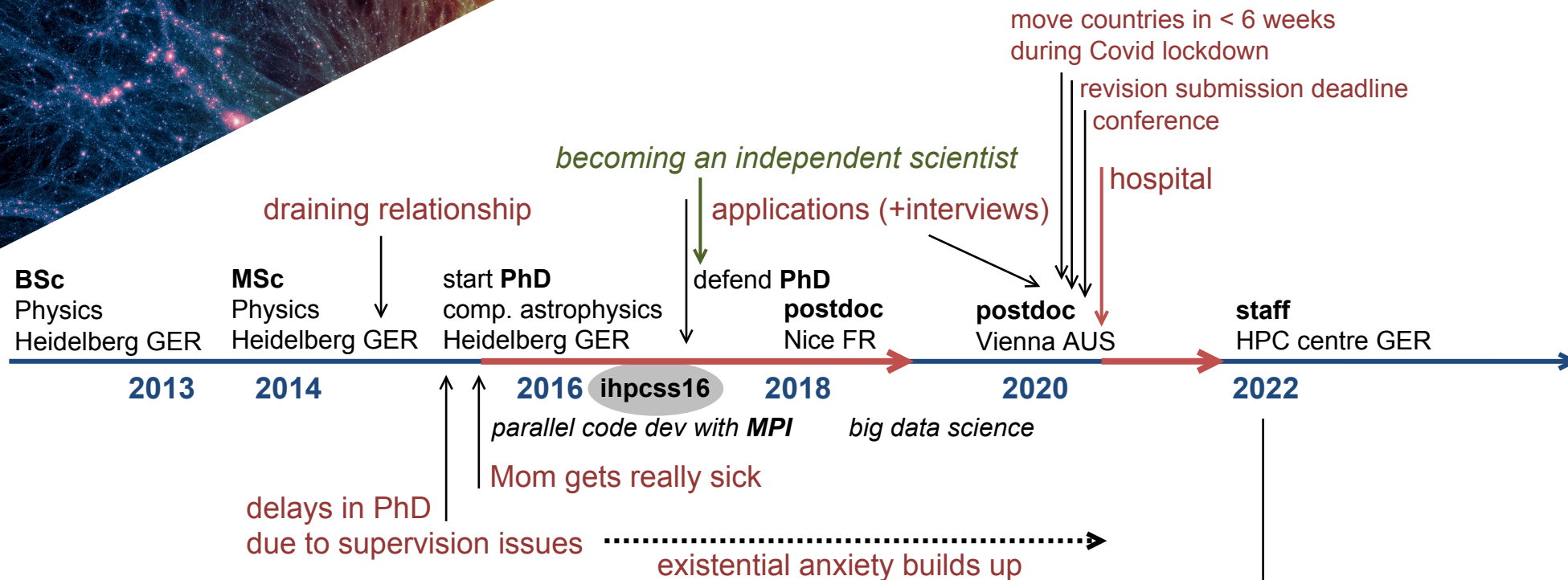


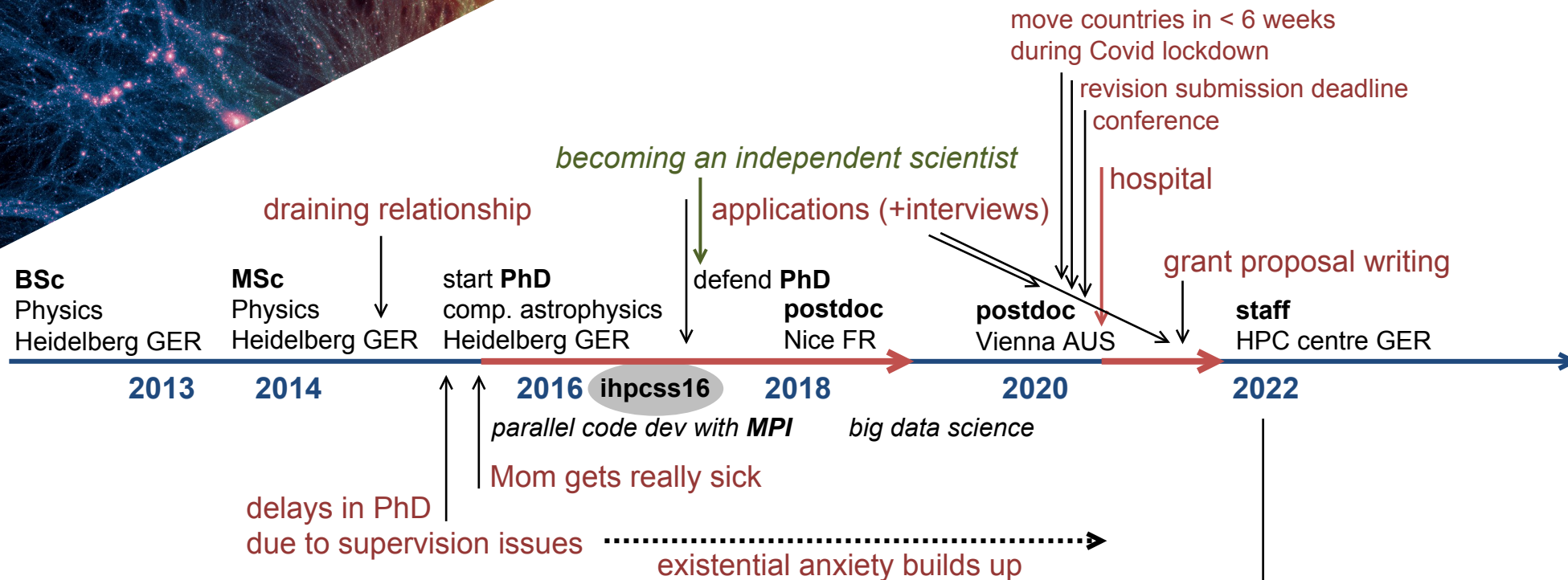
Jolanta Zjupa











Returning Mentor Career Lightning Talks

Lorenz
Canaval

**INTERNATIONAL HPC SUMMER SCHOOL
2024**

Kobe, Japan – 7-12 July, 2024





Lorenz CANAVAL

Mentor Lightning Talk at IHPCSS24

CAREER PATH

- // Which career path is yours: **expert** or **leader**?
- // **Base:** good knowledge of yourself (reflect, explore, mentoring/coaching)

	Expert	Leader
Pros (+)	Deep level of knowledge Hard-skills focus	Visibility in-house and outside Transferable skills Focus on soft skills
Cons (–)	Less visibility Expert in a niche area → risky?	Surface-level knowledge (partly) Making (unpopular) decisions

ACADEMIC PATH

Comp. Chem. Expert

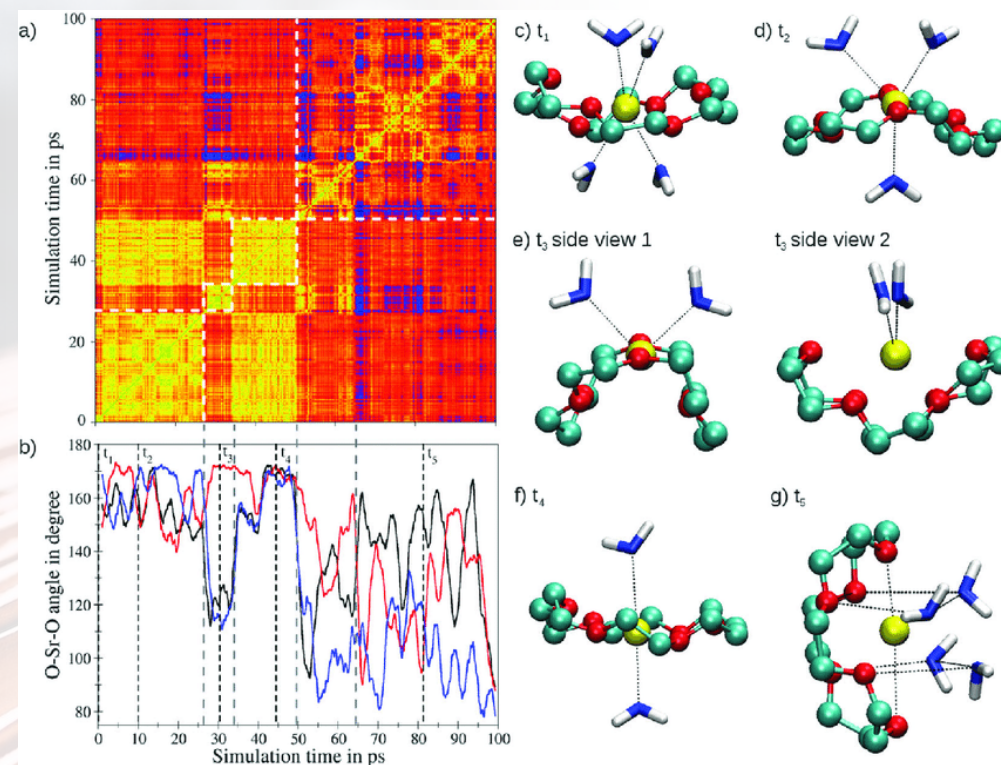
Soft Skills Newbie

// Master in Computational chemistry

// PhD in Computational chemistry

// + HPC-Sys-Admin at Department

// + Mentor at university,
exchange programs in SE-Asia



CURRENT JOB

Comp. Chem. Expert

Metallurgy Newbie

Soft Skills Newbie

Soft Skills Newbie

// At **Montanwerke Brixlegg AG**
„a leading European secondary
copper smelter using 100 percent
recycled raw material”
located in **Austria/Europe**



CURRENT JOB

Comp. Chem. Expert

Metallurgy Newbie

Soft Skills Newbie

Soft Skills Newbie

// At **Montanwerke Brixlegg AG**

// Started as Assistant in R&D, 1 year



CURRENT JOB

Financial Newbie

Comp. Chem. Expert

Metallurgy Newbie

Metallurgy Basics

Soft Skills Newbie

Soft Skills Newbie

Soft Skills Newbie

// At **Montanwerke Brixlegg AG**

// Started as Assistant in R&D, 1 year

// Offered Head of Quality



CURRENT JOB

Financial Newbie

Financial Basics

Comp. Chem. Expert

Metallurgy Newbie

Metallurgy Basics

Metallurgy Expert

Soft Skills Newbie

Soft Skills Newbie

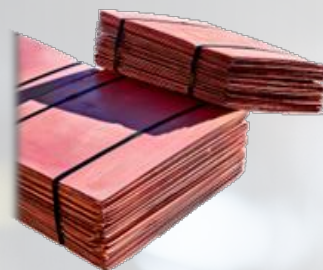
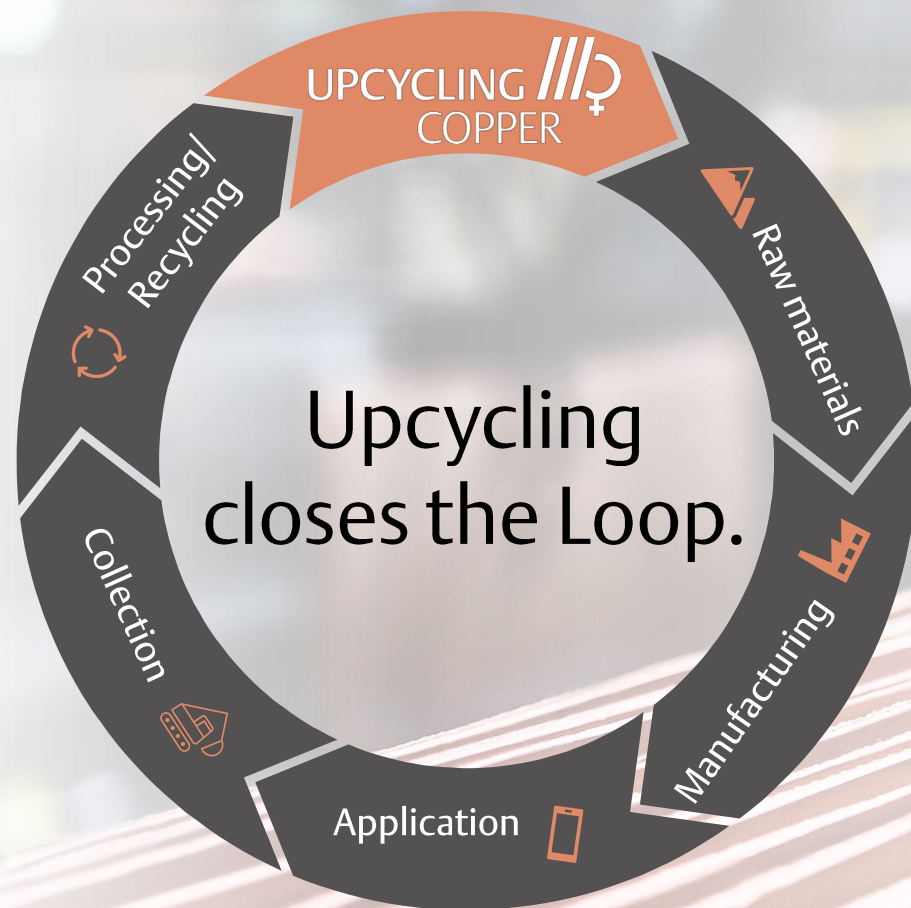
Soft Skills Newbie

Soft Skills Experience

- // At **Montanwerke Brixlegg AG**
- // Started as Assistant in R&D, 1 year
- // Currently Head of Quality, 7 years
- // Approx. 20 staff
- // 7-figure annual budget
- // Laboratory, certifications, quality projects, international customers, claim mgmt., radiation protection, chemical mgmt., courses ...



CIRCULAR ECONOMY



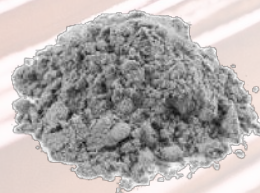
Copper Cathodes and Billets
(150 000 + 70 000 tons/a)



Silver, Gold, Platinum,
Palladium



Nickel Sulphate
(2 000 tons/a)



Zinc-, Tin- and Lead-
Containing Dusts
(5 000 tons/a)

Returning Mentor Career Lightning Talks

Mariia
Ivonina

**INTERNATIONAL HPC SUMMER SCHOOL
2024**

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Career path



Exchange student
at Tokyo U

JSPS PD
researcher

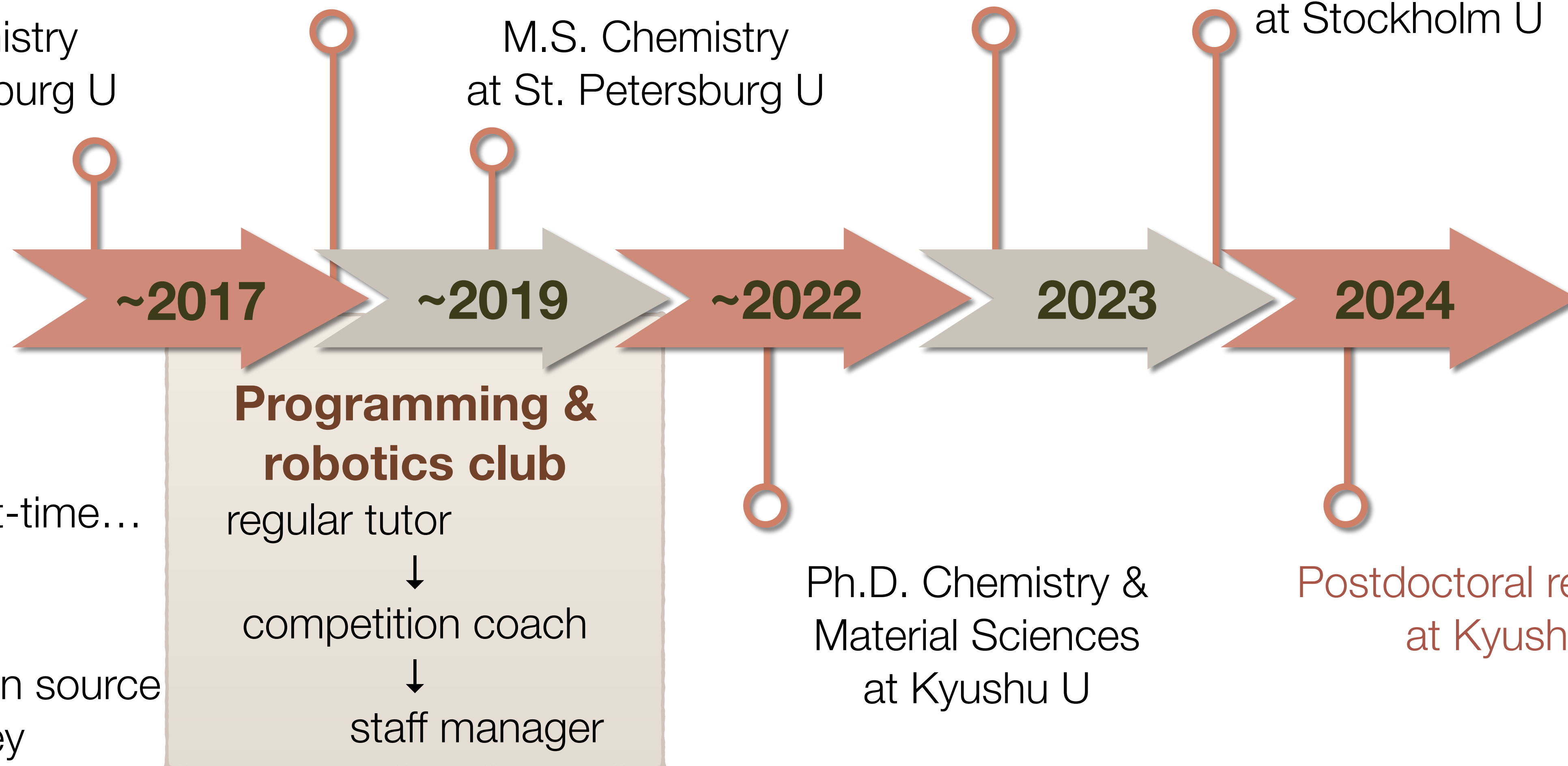
Visiting researcher
at Stockholm U

B.S. Chemistry
at St. Petersburg U

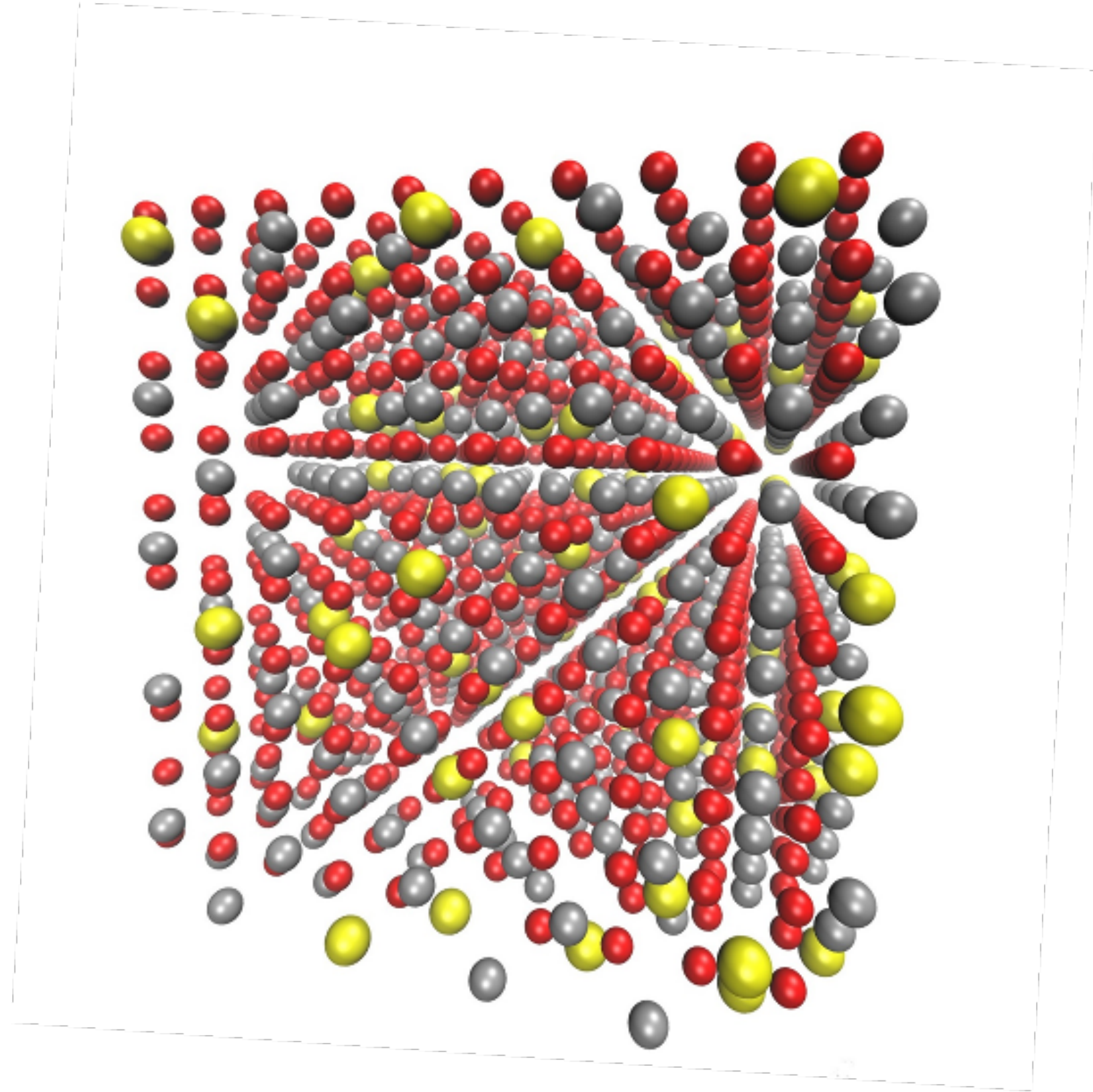
M.S. Chemistry
at St. Petersburg U

Ph.D. Chemistry &
Material Sciences
at Kyushu U

Postdoctoral researcher
at Kyushu U

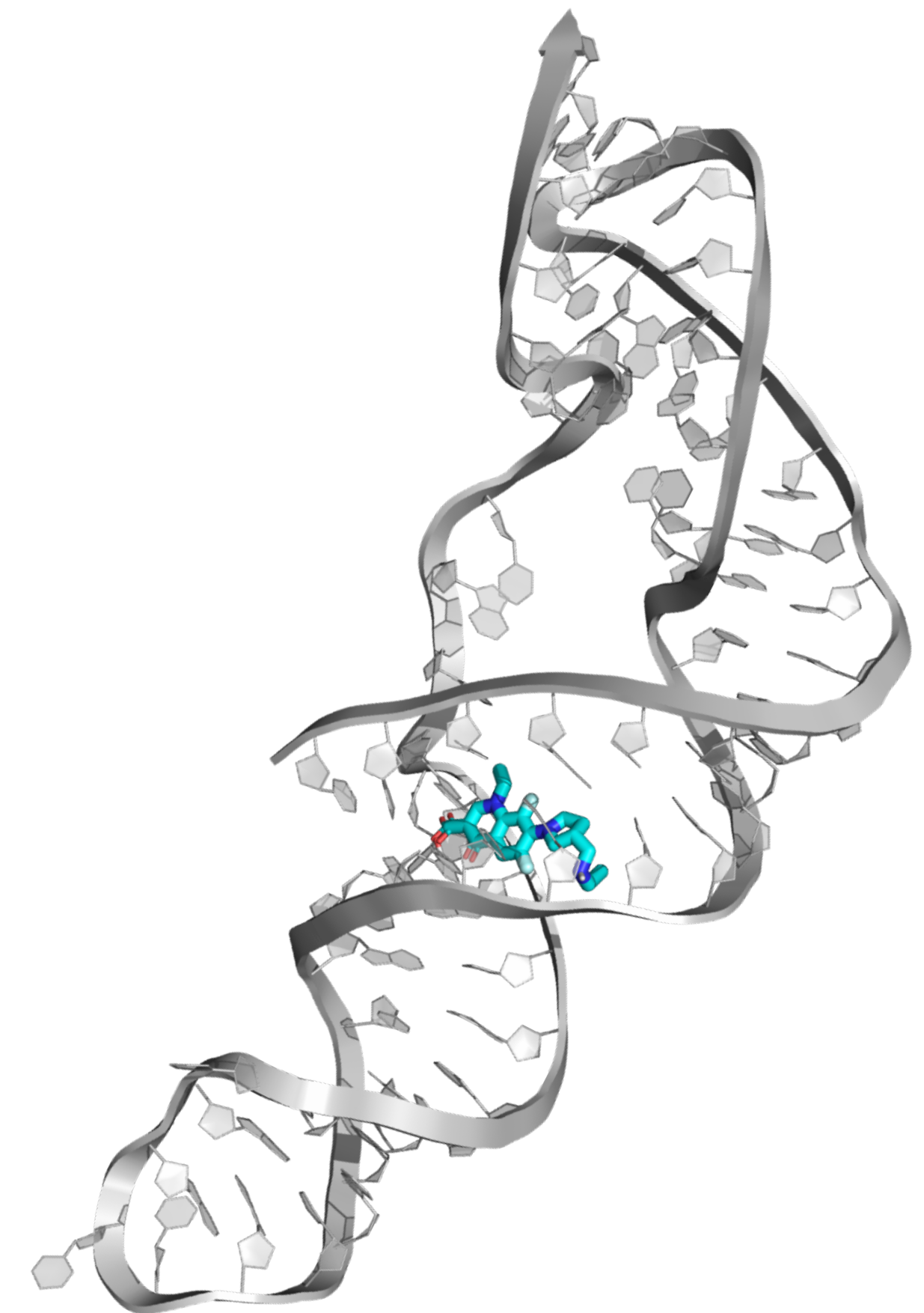


Research topics: Molecular Dynamics & Monte Carlo simulation

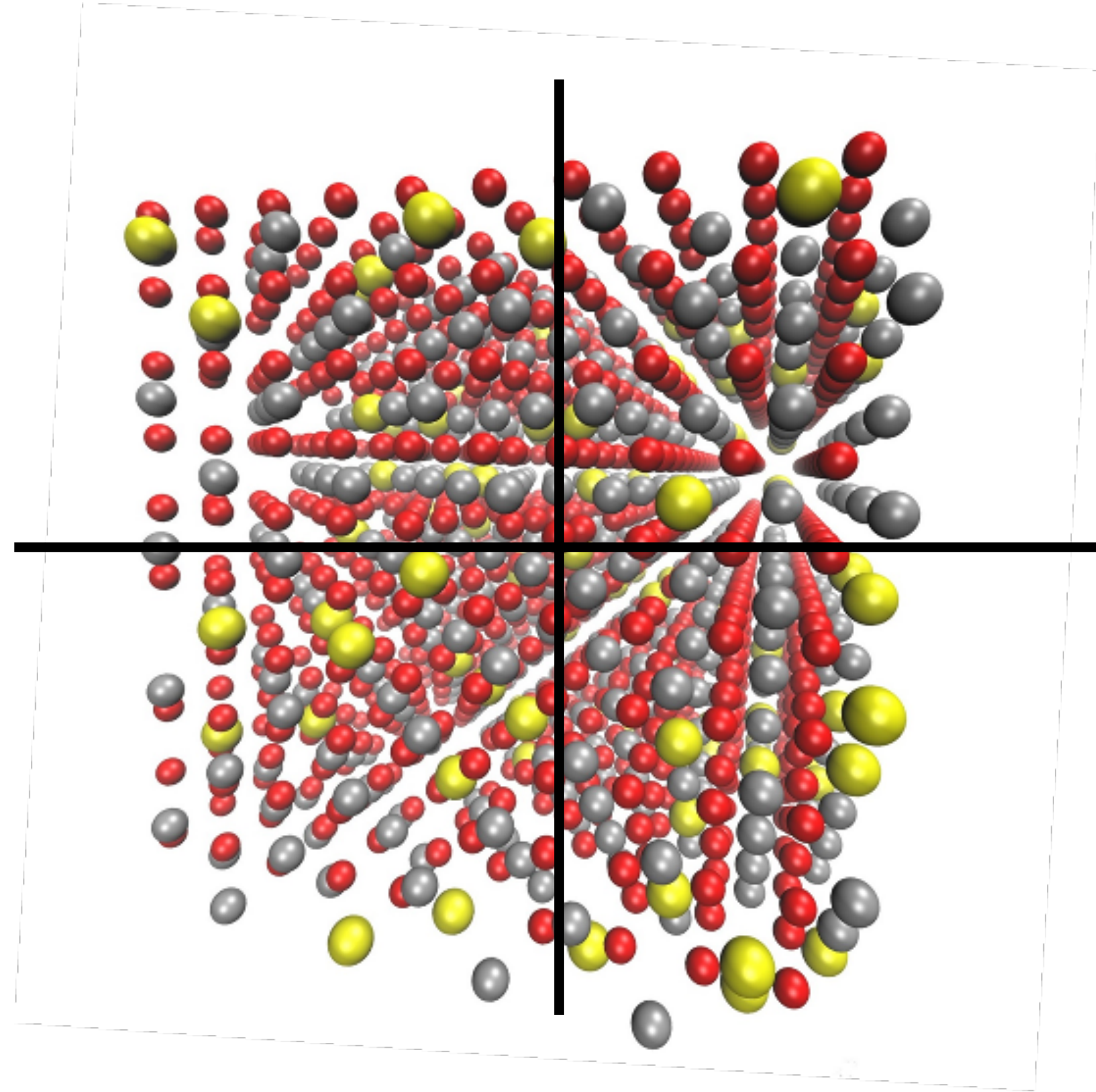


YSZ crystal for Solid Oxide Fuel Cell (SOFC)

SARS-CoV-2 RNA pseudoknot
with drug molecule



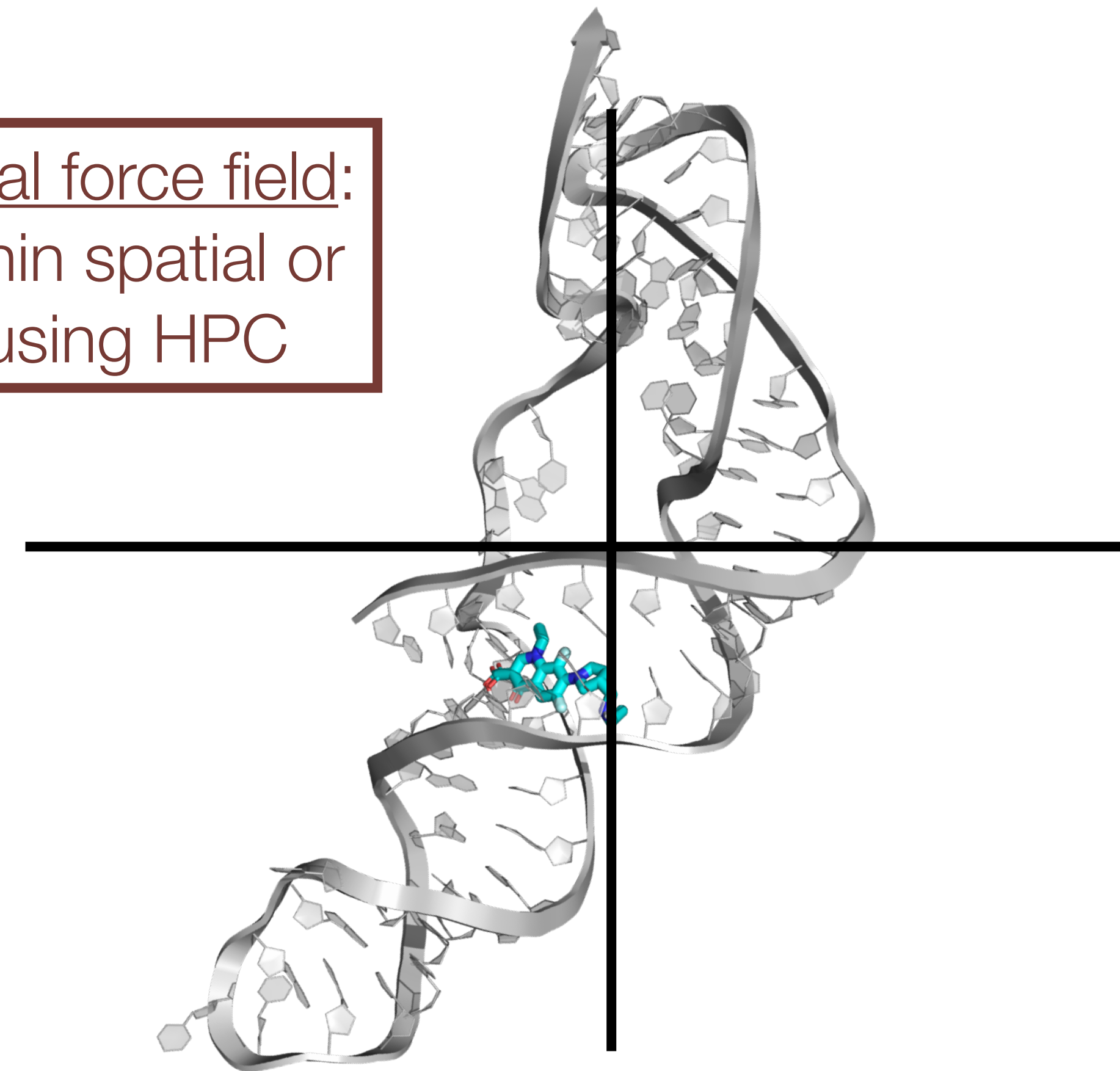
Research topics: Molecular Dynamics & Monte Carlo simulation



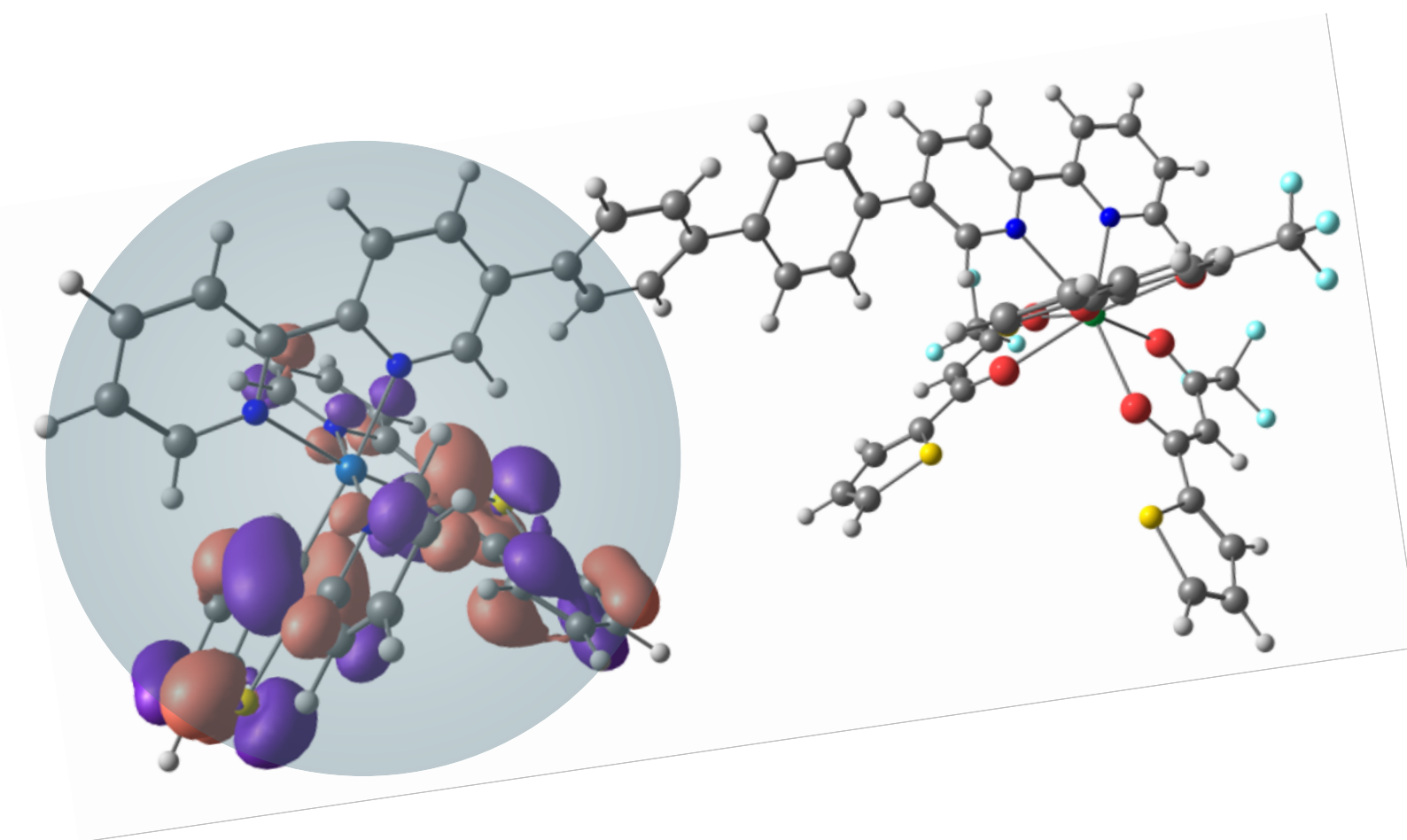
YSZ crystal for Solid Oxide Fuel Cell (SOFC)

SARS-CoV-2 RNA pseudoknot
with drug molecule

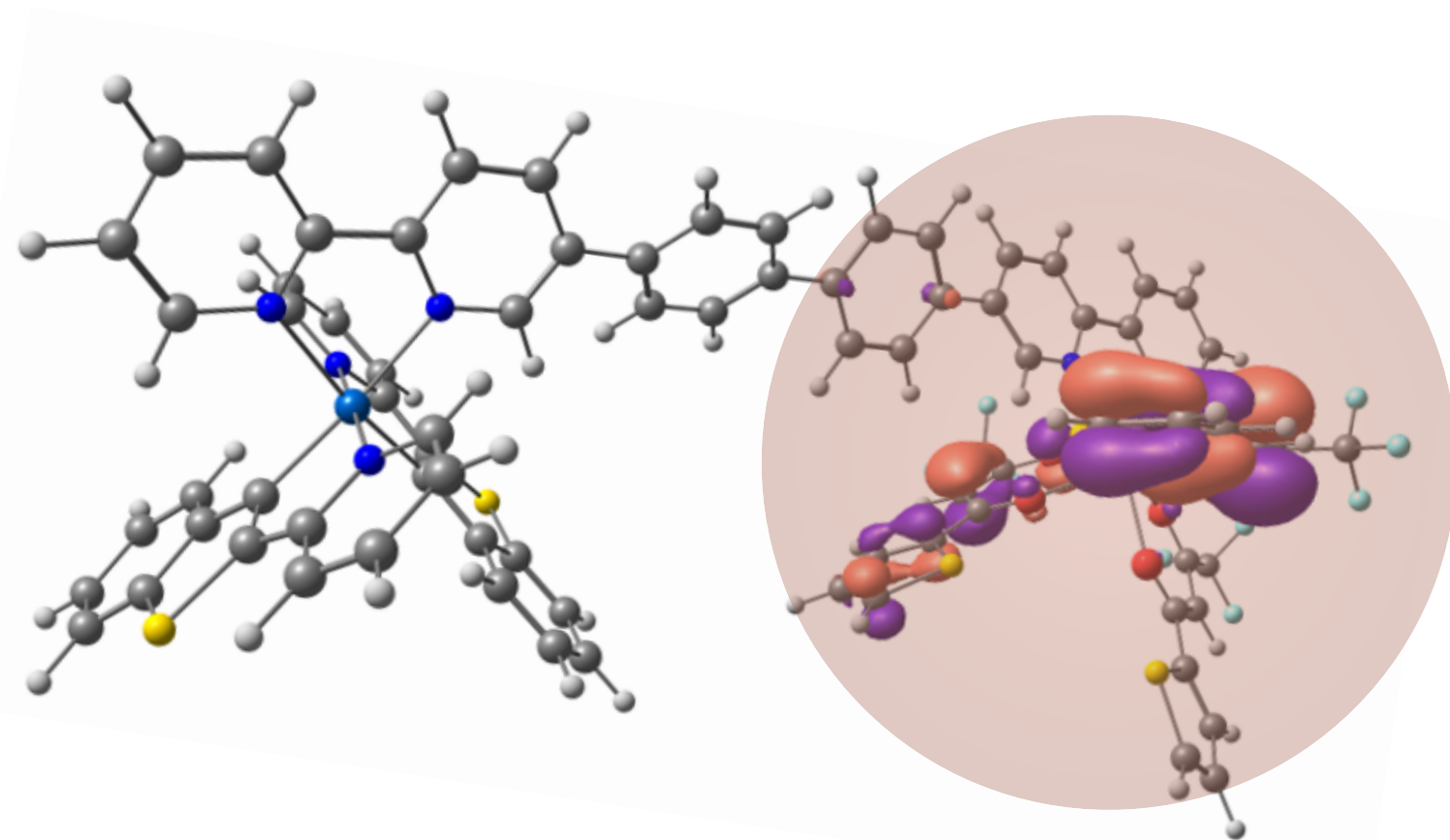
Molecular mechanical force field:
calculate forces within spatial or
particle domains using HPC



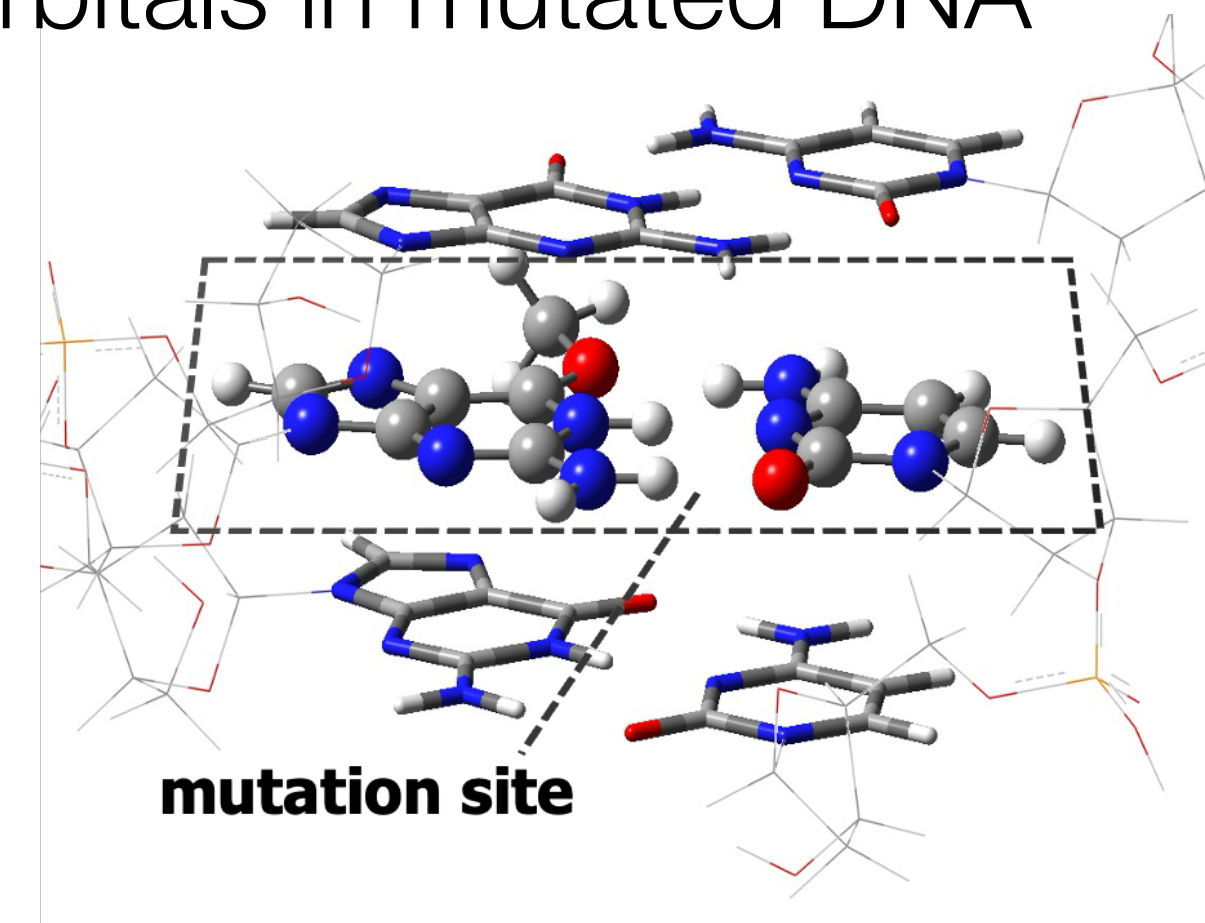
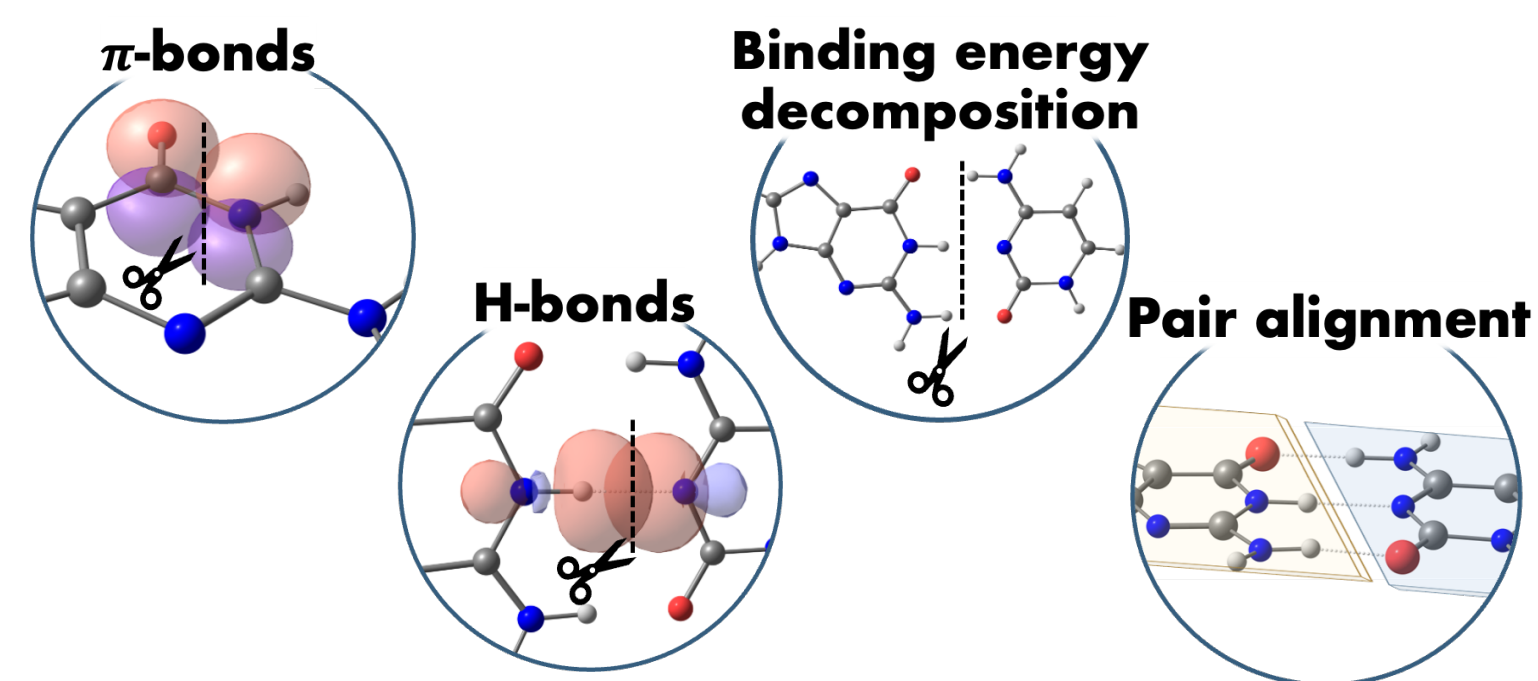
Research topics: Quantum Chemistry calculations



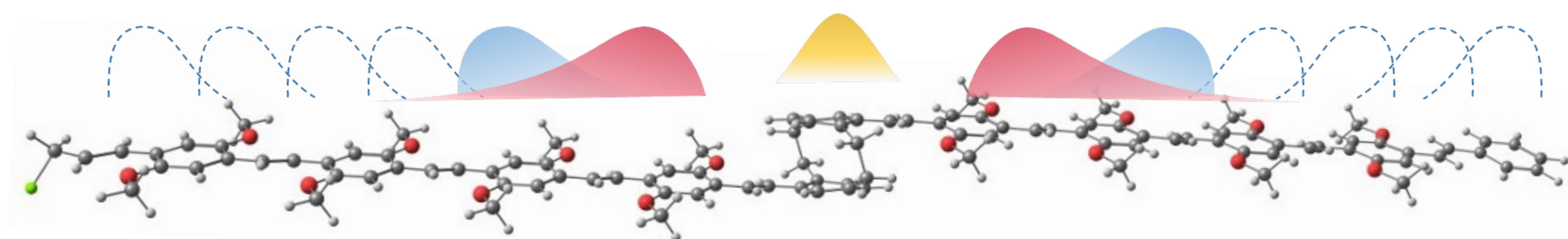
fluorescent Ir-Ln complexes



interaction analysis of molecular orbitals in mutated DNA

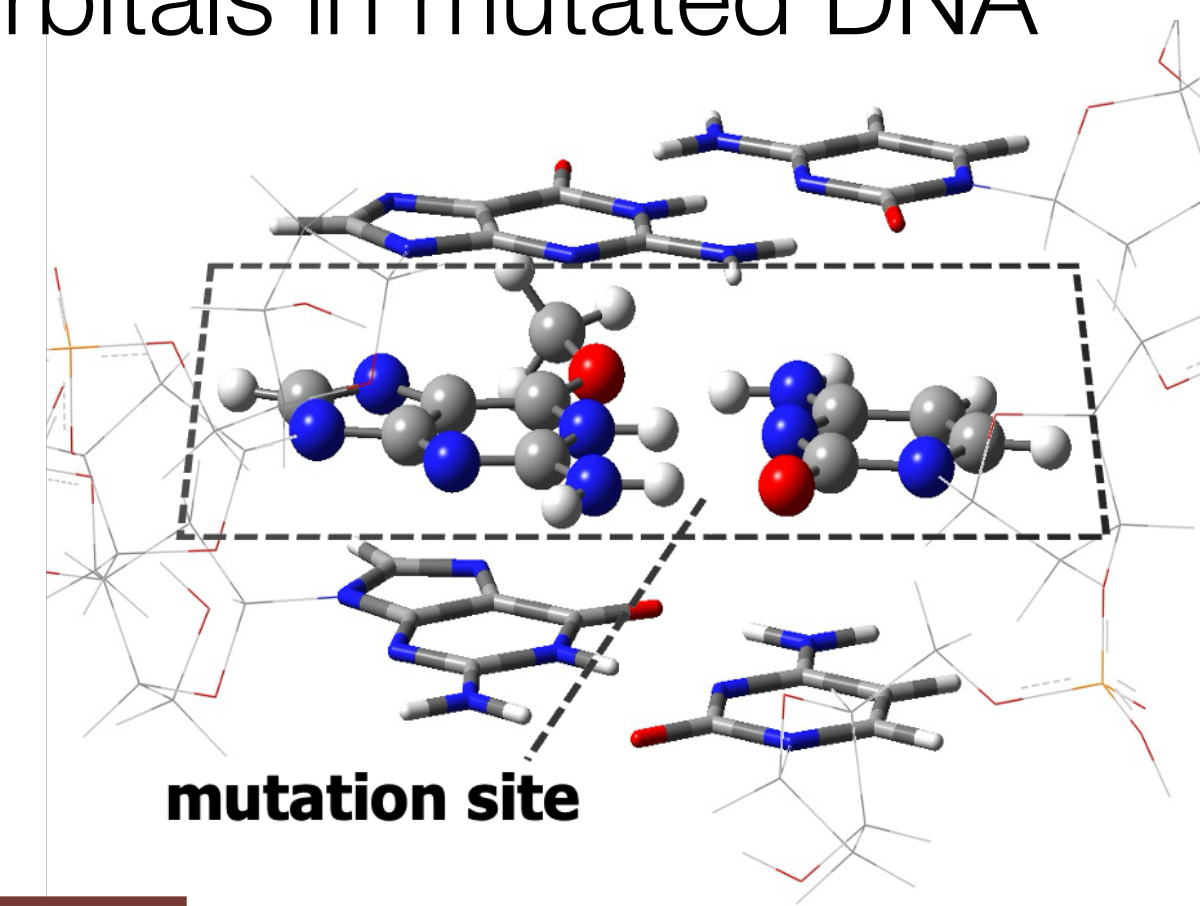
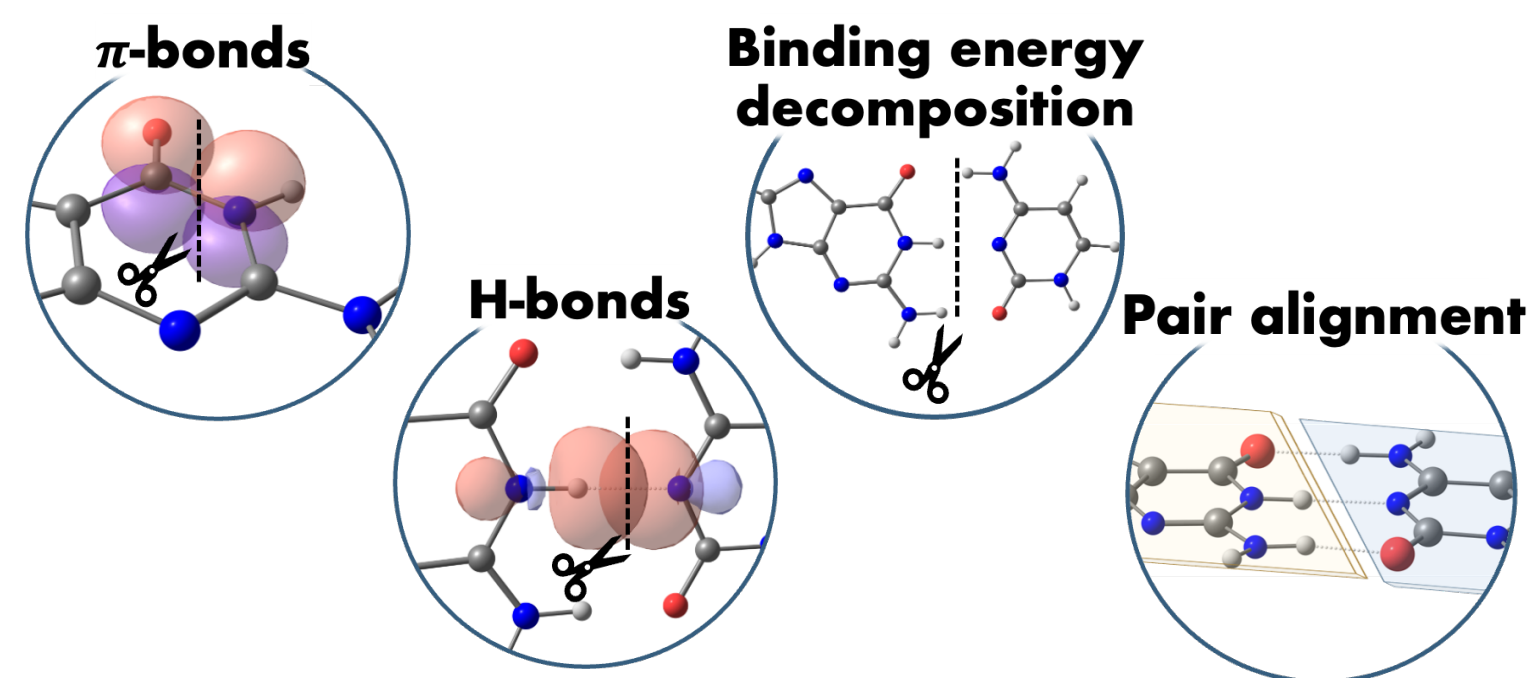


Localized orbitals-based
O(N) complexity method for calculating large polymer chains



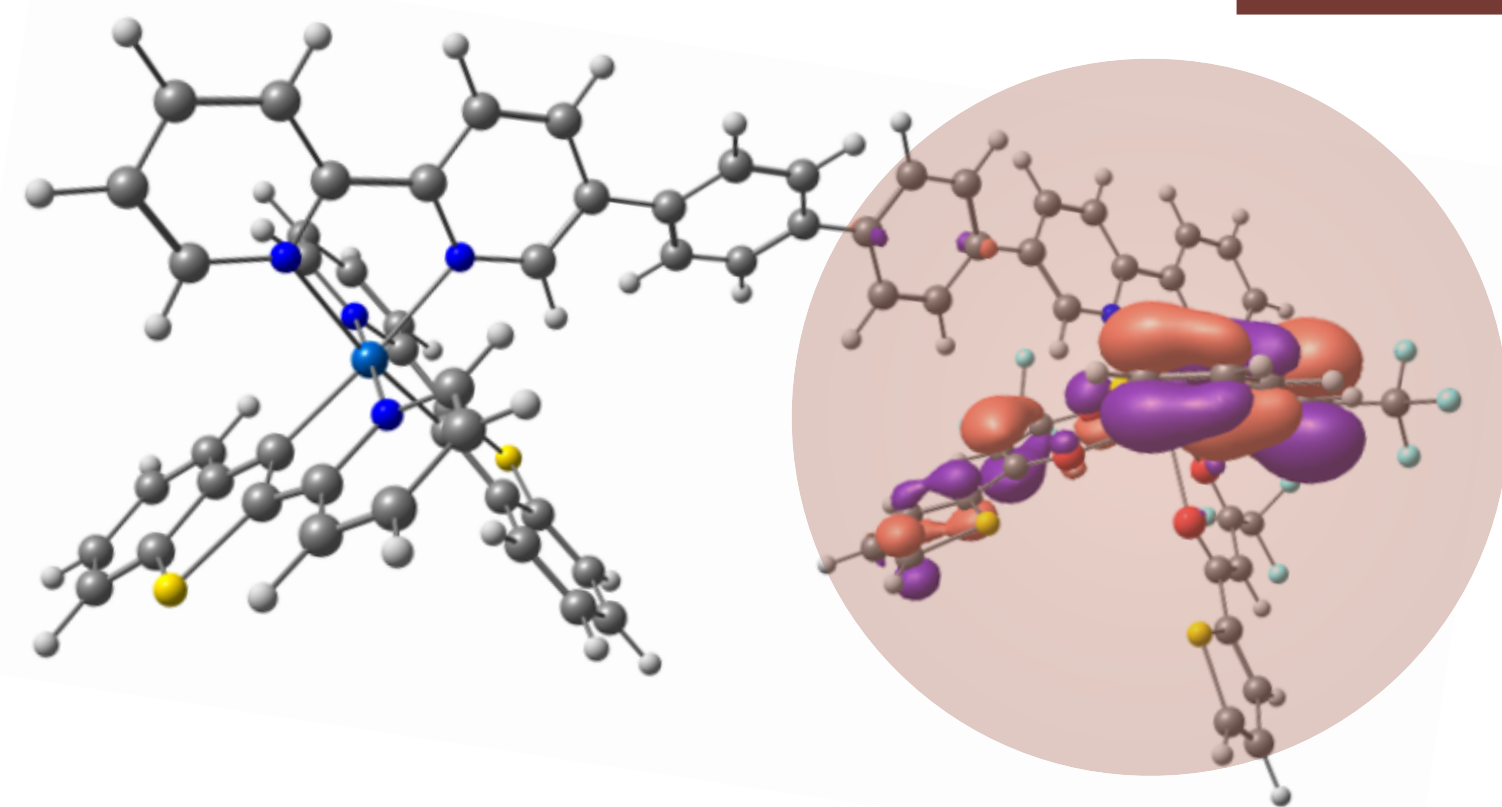
Research topics: Quantum Chemistry calculations

interaction analysis of molecular orbitals in mutated DNA

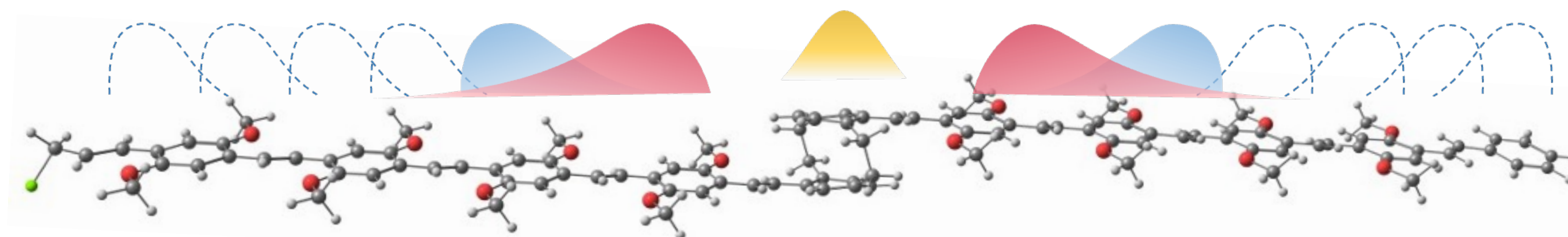


fluorescent Ir-Ln complexes

$\hat{H}\psi = E\psi$ wave function description:
distributed calculation of electron integrals using HPC



Localized orbitals-based
 $O(N)$ complexity method for calculating large polymer chains



Struggles & Solutions

- Moved to a new country with completely unfamiliar language and culture
→ learn language and integrate into local society
- Had no scholarship, no funding
→ search and apply for alternative fundings, participate in contests, become the PI of my own project
- VISA issues that limit the scientific freedom
→ seek support from expatriates and old friends in academia

Networking is important!



Taiko performance

Returning Mentor Career Lightning Talks

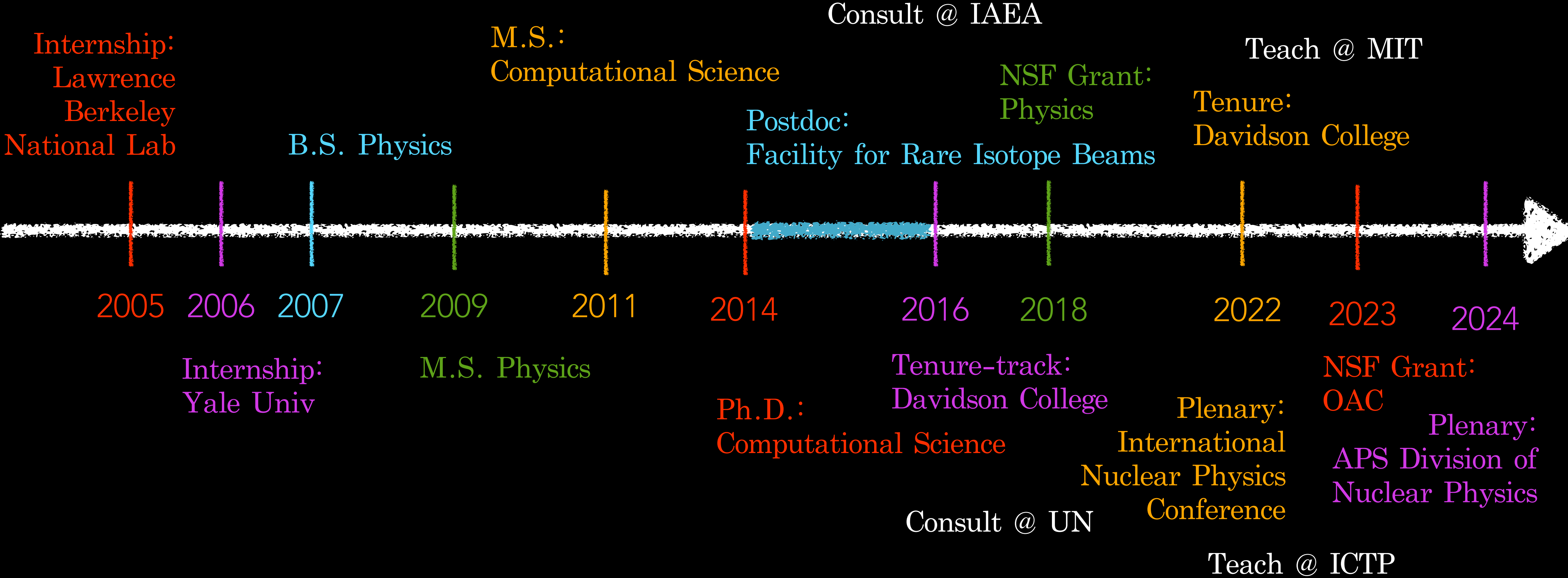
Michelle
Kuchera

**INTERNATIONAL HPC SUMMER SCHOOL
2024**

Kobe, Japan – 7-12 July, 2024



MY CAREER PATH: IN TWO STORIES



MY CAREER PATH: IN TWO STORIES

PRL 101, 142504 (2008)

PHYSICAL REVIEW LETTERS

week ending
3 OCTOBER 2008

Intruder Configurations in the $A = 33$ Isobars: ^{33}Mg and ^{33}Al

Vandana Tripathi,¹ S. L. Tabor,¹ P. F. Mantica,^{2,3} Y. Utsuno,⁴ P. Bender,¹ J. Cook,² C. R. Hoffman,¹ Sangjin Lee,¹ T. Otsuka,^{5,6} J. Pereira,² M. Perry,¹ K. Pepper,¹ J. S. Pinter,³ J. Stoker,³ A. Volya,¹ and D. Weisshaar²

¹Department of Physics, Florida State University, Tallahassee, Florida 32306, USA

²National Superconducting Cyclotron Laboratory, Michigan State University, East Lansing, Michigan 48824, USA

³Department of Chemistry, Michigan State University, East Lansing, Michigan 48824, USA

⁴Japan Atomic Energy Agency, Tokai, Ibaraki 319-1195, Japan

⁵Department of Physics and Center for Nuclear Study, University of Tokyo, Hongo, Tokyo 113-0033, Japan

⁶RIKEN, Hirosawa, Wako-shi, Saitama 351-0198, Japan

(Received 2 July 2008; published 2 October 2008)

Physics Letters B 813 (2021) 136041

Contents lists available at ScienceDirect

Physics Letters B

www.elsevier.com/locate/physletb

Bayesian neural networks for fast SUSY predictions

B.S. Kronheim^{a,*}, M.P. Kuchera^a, H.B. Prosper^b, A. Karbo^a

^a Department of Physics, Davidson College, Davidson, NC 28035, USA

^b Department of Physics, Florida State University, Tallahassee, FL 32306, USA

Implicit Quantile Neural Networks for Jet Simulation and Correction

Braden Kronheim
Department of Physics
University of Maryland
College Park, MD 20742
bkronhei@umd.edu

Michelle P. Kuchera
Department of Physics
Davidson College
Davidson, NC 28035
mikuchera@davidson.edu

Harrison B. Prosper
Department of Physics
Florida State University
Tallahassee, FL 32306
hprosper@fsu.edu

Raghuram Ramanujan
Department of Mathematics & Computer Science
Davidson College
Davidson, NC 28035
raramanujan@davidson.edu

Artificial Intelligence for
Accelerating Nuclear Applications,
Science and Technology

AI

IAEA
International Atomic Energy Agency

Simulation of Electron-Proton Scattering Events by a Feature-Augmented and Transformed Generative Adversarial Network (FAT-GAN)

Yasir Alanazi¹, Nobuo Sato², Tianbo Liu², Wally Melnitchouk², Pawel Ambrozewicz², Florian Hauenstein³, Michelle P. Kuchera⁴, Evan Pritchard⁴, Michael Robertson⁵, Ryan Strauss⁵, Luisa Velasco⁶ and Yaohang Li¹

¹Department of Computer Science, Old Dominion University, Norfolk, Virginia 23529

²Jefferson Lab, Newport News, Virginia 23606

³Department of Physics, Old Dominion University, Norfolk, Virginia 23529

⁴Department of Physics, Davidson College, Davidson, North Carolina 28035

⁵Department of Mathematics and Computer Science, Davidson College, Davidson, North Carolina 28035

⁶Department of Physics, University of Dallas, Irving, Texas 75062

yalan001@odu.edu, {nsato, liutb, wmelnitc, pawel, hauenst}@jlab.org, {mikuchera, evpritchard, mirobertson, rstrauss}@davidson.edu, lvelasco@udallas.edu, yaohang@cs.odu.edu

EPJ Web of Conferences 251, 03055 (2021)

https://doi.org/10.1051/epjconf/202125103055

CHEP 2021

Conditional Wasserstein Generative Adversarial Networks for Fast Detector Simulation

John Blue^{1,*}, Braden Kronheim¹, Michelle Kuchera¹, and Raghuram Ramanujan¹

¹Davidson College, Davidson, North Carolina 28035, United States

REVIEWS OF MODERN PHYSICS

Recent Accepted Authors Referees Search Press About Editorial Team

Colloquium: Machine learning in nuclear physics

Amber Boehnlein, Markus Diefenthaler, Nobuo Sato, Malachi Schram, Veronique Ziegler, Cristiano Fanelli, Morten Hjorth-Jensen, Tanja Horn, Michelle P. Kuchera, Dean Lee, Witold Nazarewicz, Peter Ostroumov, Kostas Orginos, Alan Poon, Xin-Nian Wang, Alexander Scheinker, Michael S. Smith, and Long-Gang Pang

Rev. Mod. Phys. **94**, 031003 – Published 8 September 2022

Computer Physics Communications 270 (2022) 108168

Contents lists available at ScienceDirect

Computer Physics Communications

www.elsevier.com/locate/cpc

TensorBNN: Bayesian inference for neural networks using TensorFlow[☆]

B.S. Kronheim^{a,*}, M.P. Kuchera^a, H.B. Prosper^b

^a Department of Physics, Davidson College, Davidson, NC 28036, United States of America

^b Department of Physics, Florida State University, Tallahassee, FL 32306, United States of America

Internship:
Lawrence
Berkeley
National Lab

Nuclear Science

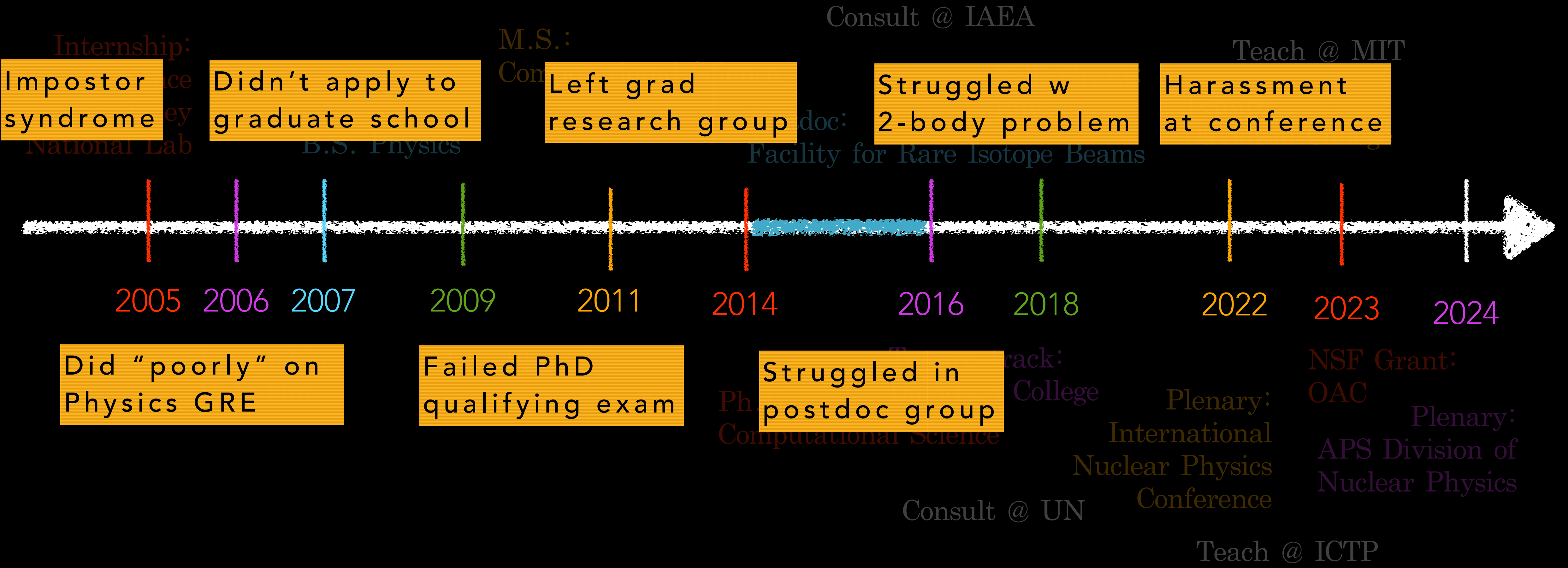
Postdoc:
Facility for Rare Isotope Beams

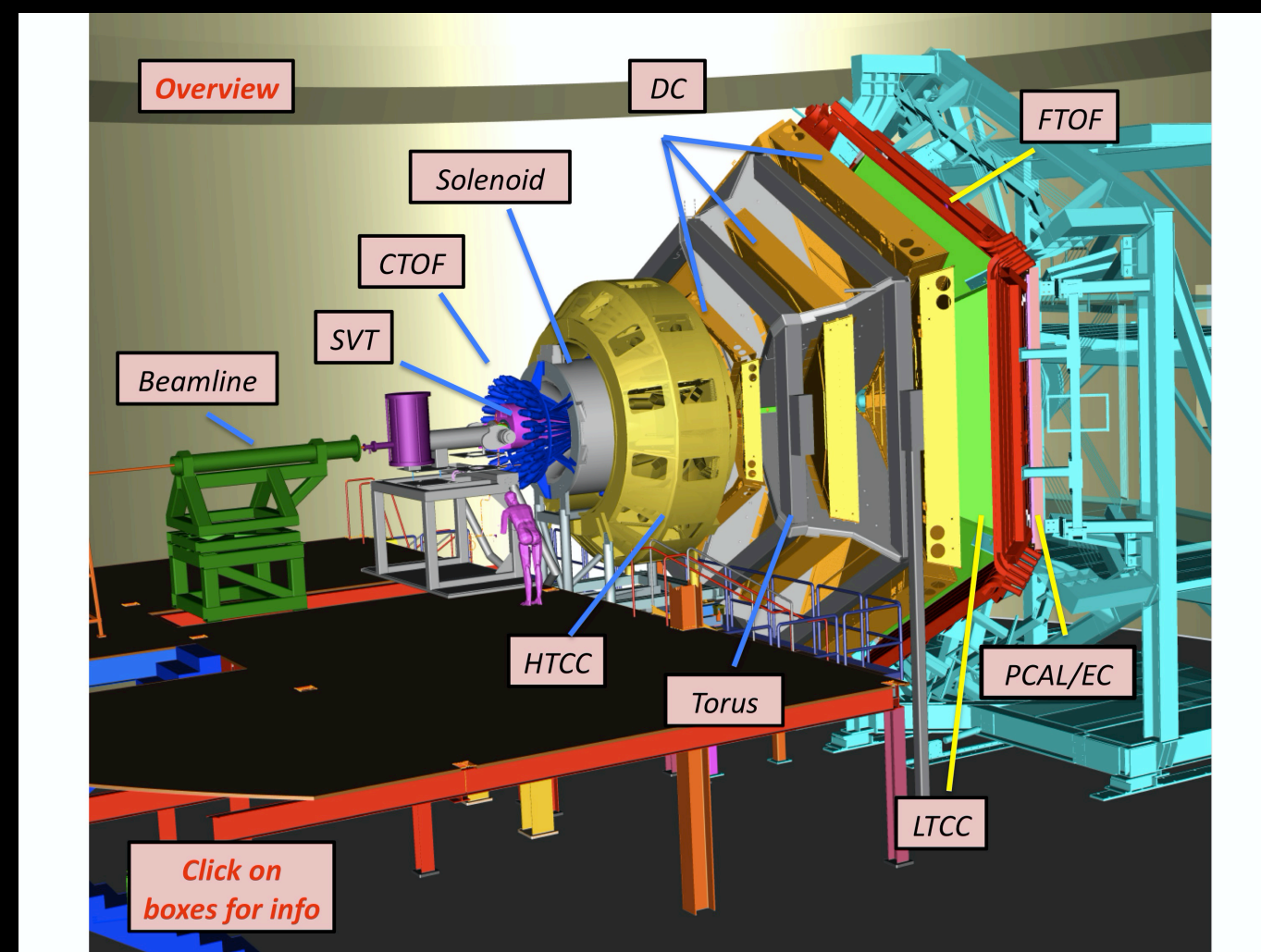
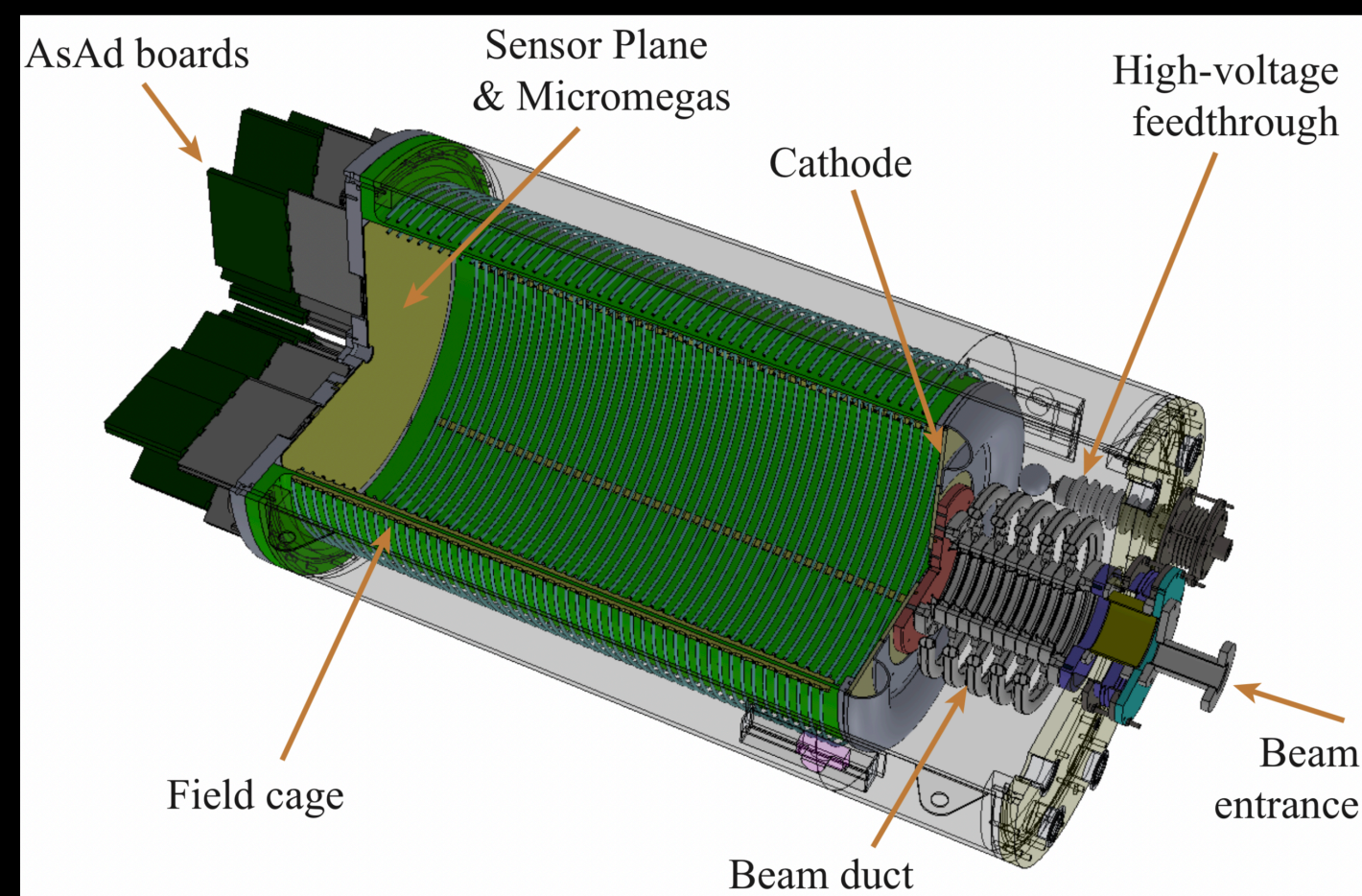
NSF
Phys

Tenure-track:
Davidson College

Teach @ ICTP

MY CAREER PATH: IN TWO STORIES

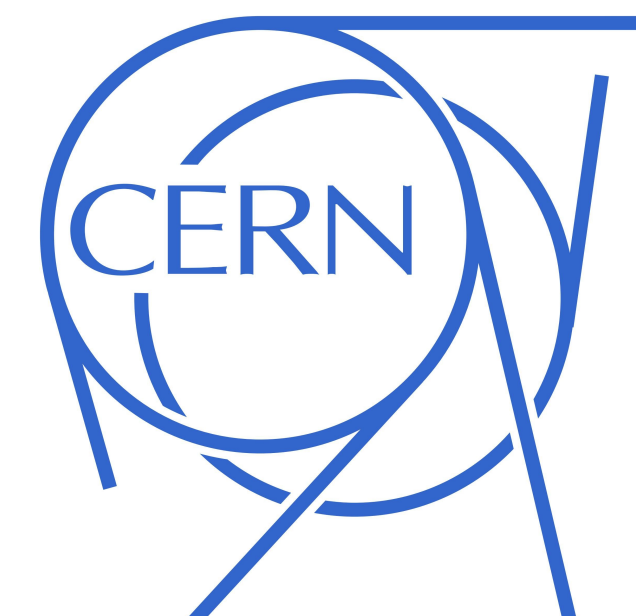




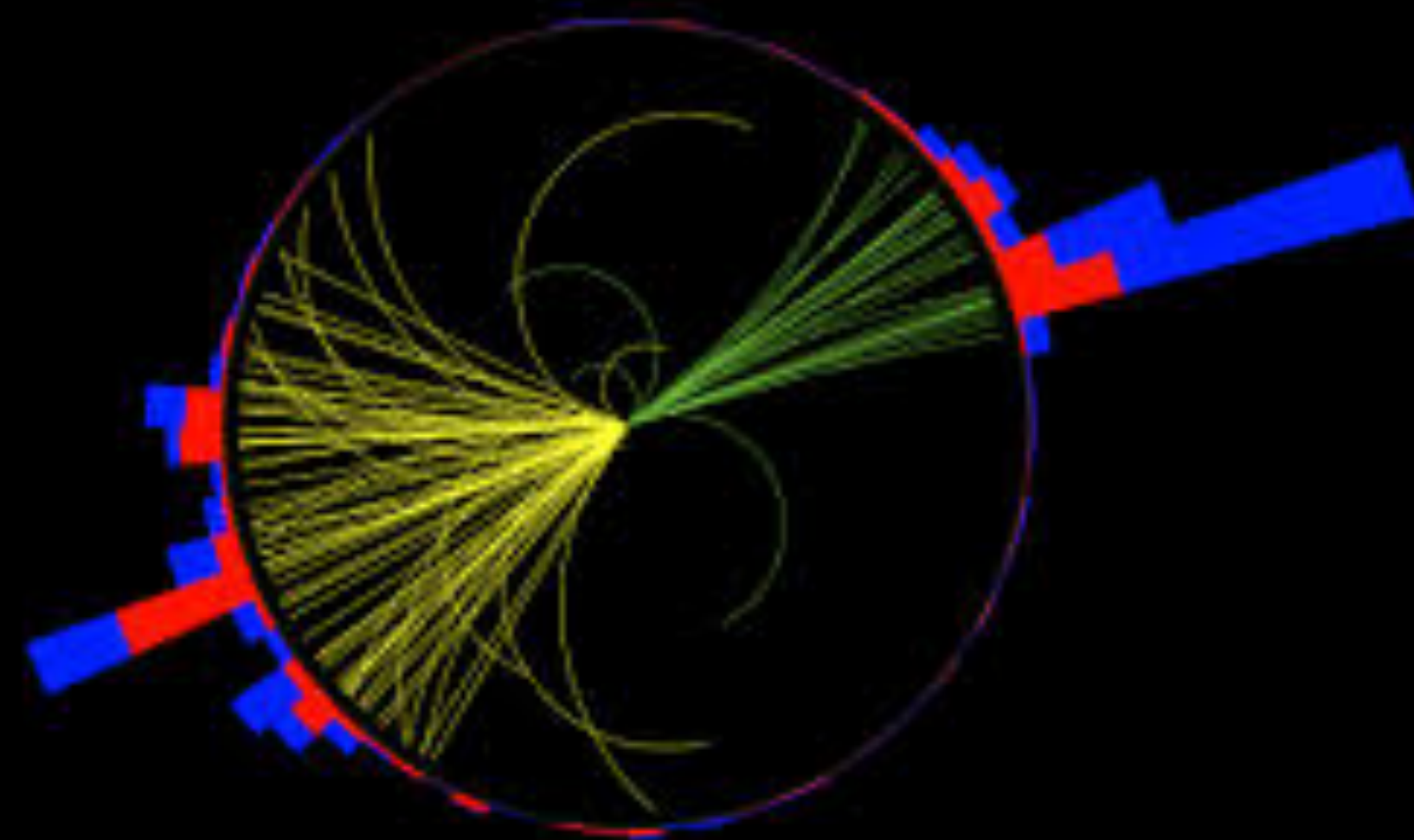
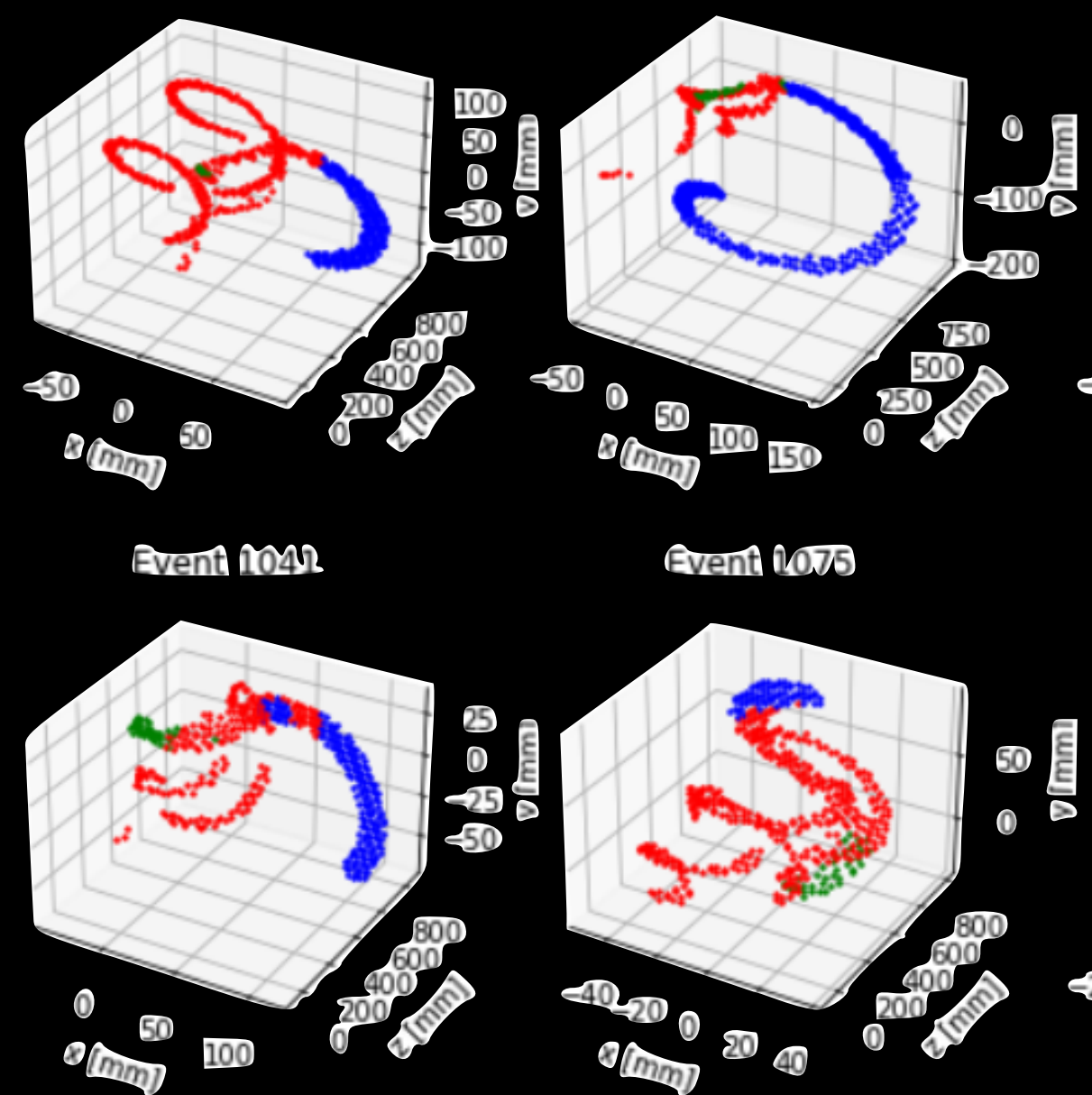
AT-TPC



CLAS 12



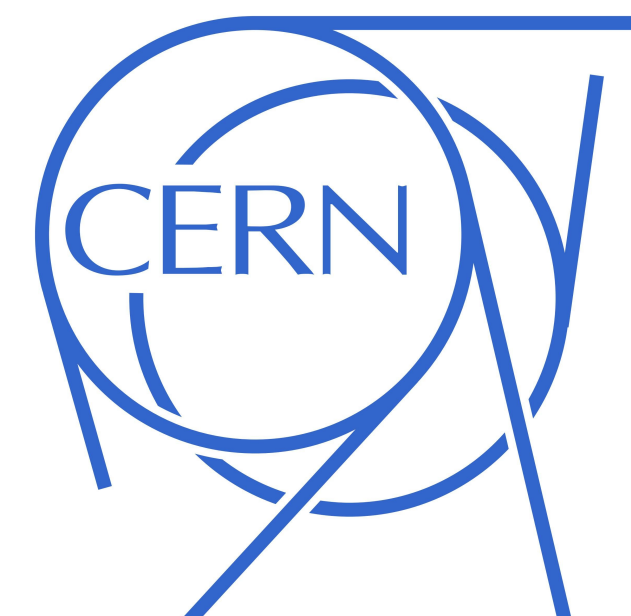
CMS



AT-TPC



CLAS 12



CMS

Returning Mentor Career Lightning Talks

Sameer
Deshmukh

**INTERNATIONAL HPC SUMMER SCHOOL
2024**

Kobe, Japan – 7-12 July, 2024



Sameer Deshmukh

Returning Mentor.

Computing Laboratory, Fujitsu, Japan.

Sameer Deshmukh, 8 July 2024.

Introduction

Background



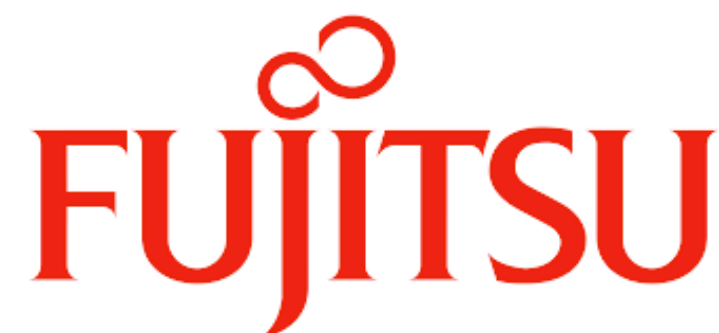
Pune, India



Sept. 2017 - Sept. 2023
Tokyo Institute of Technology

M.S. Computer Science (HPC)

Ph.D. Computer Science (HPC)

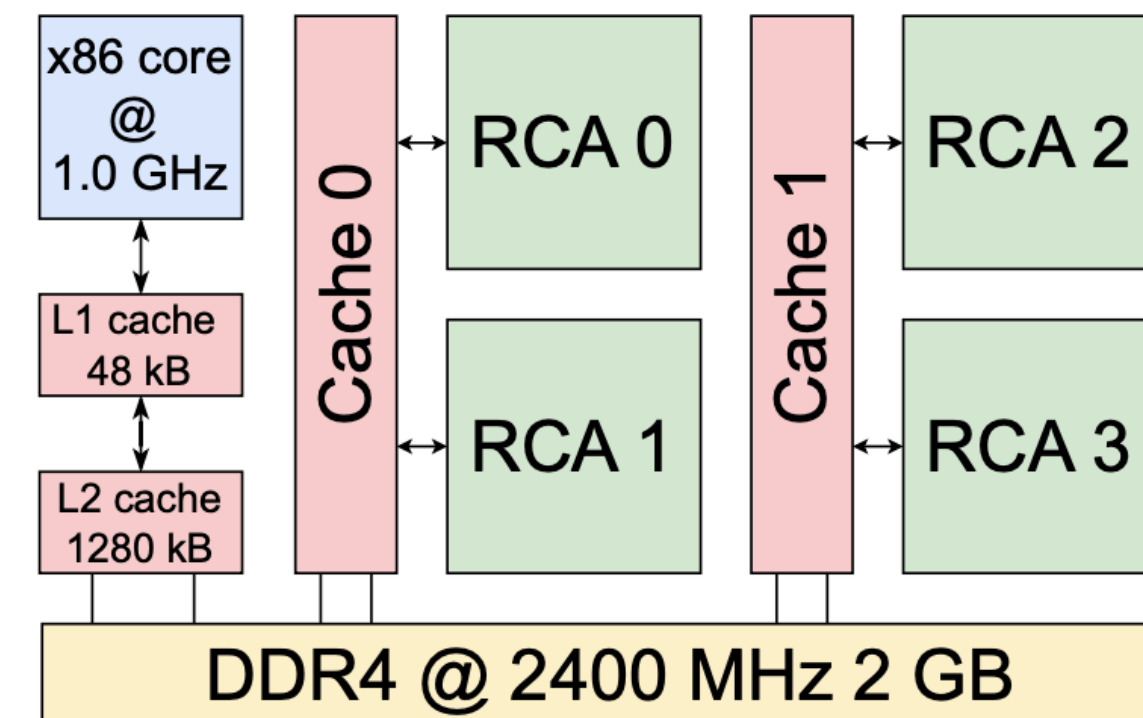


Sept. 2023 - present
AI Computer Architecture Researcher

Research Interests



Performance efficiency on supercomputers
for scientific applications

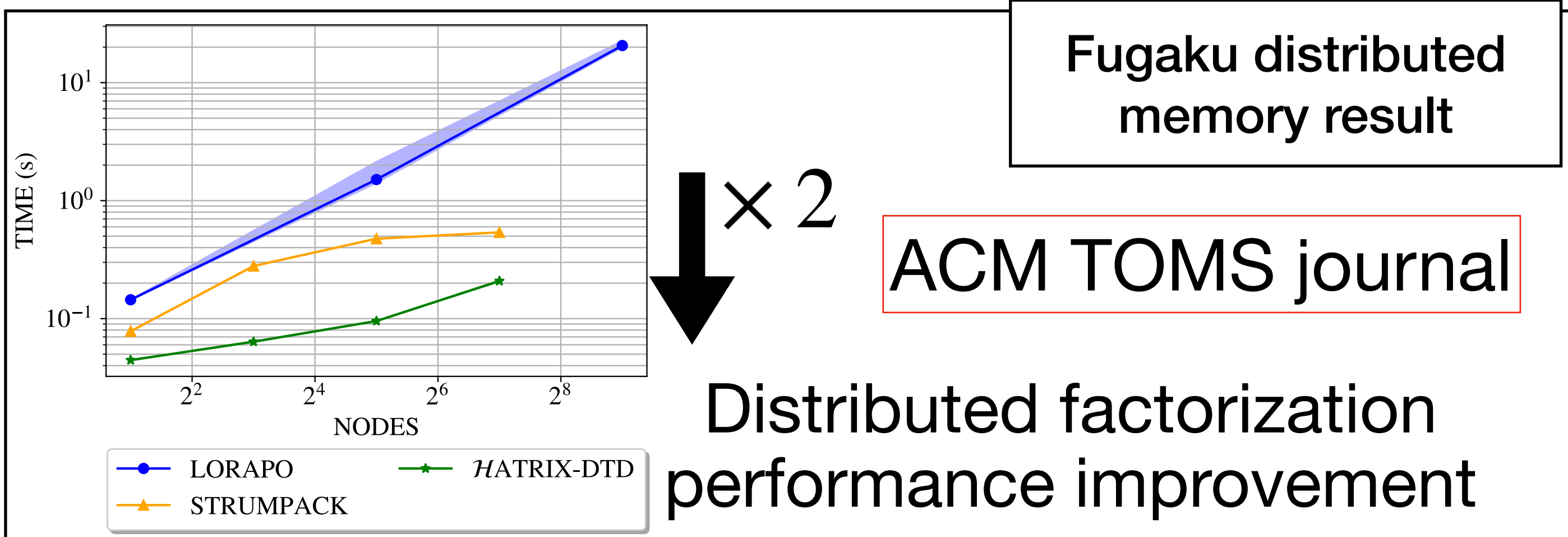
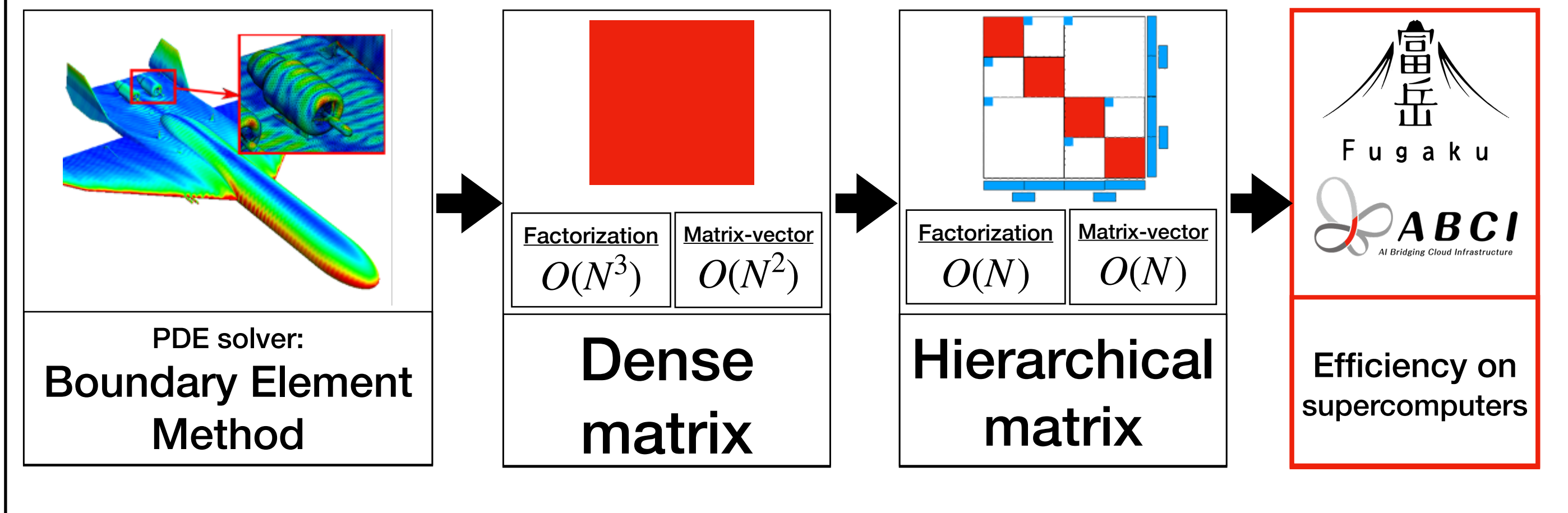


Hardware/software co-design for
acceleration of AI and science

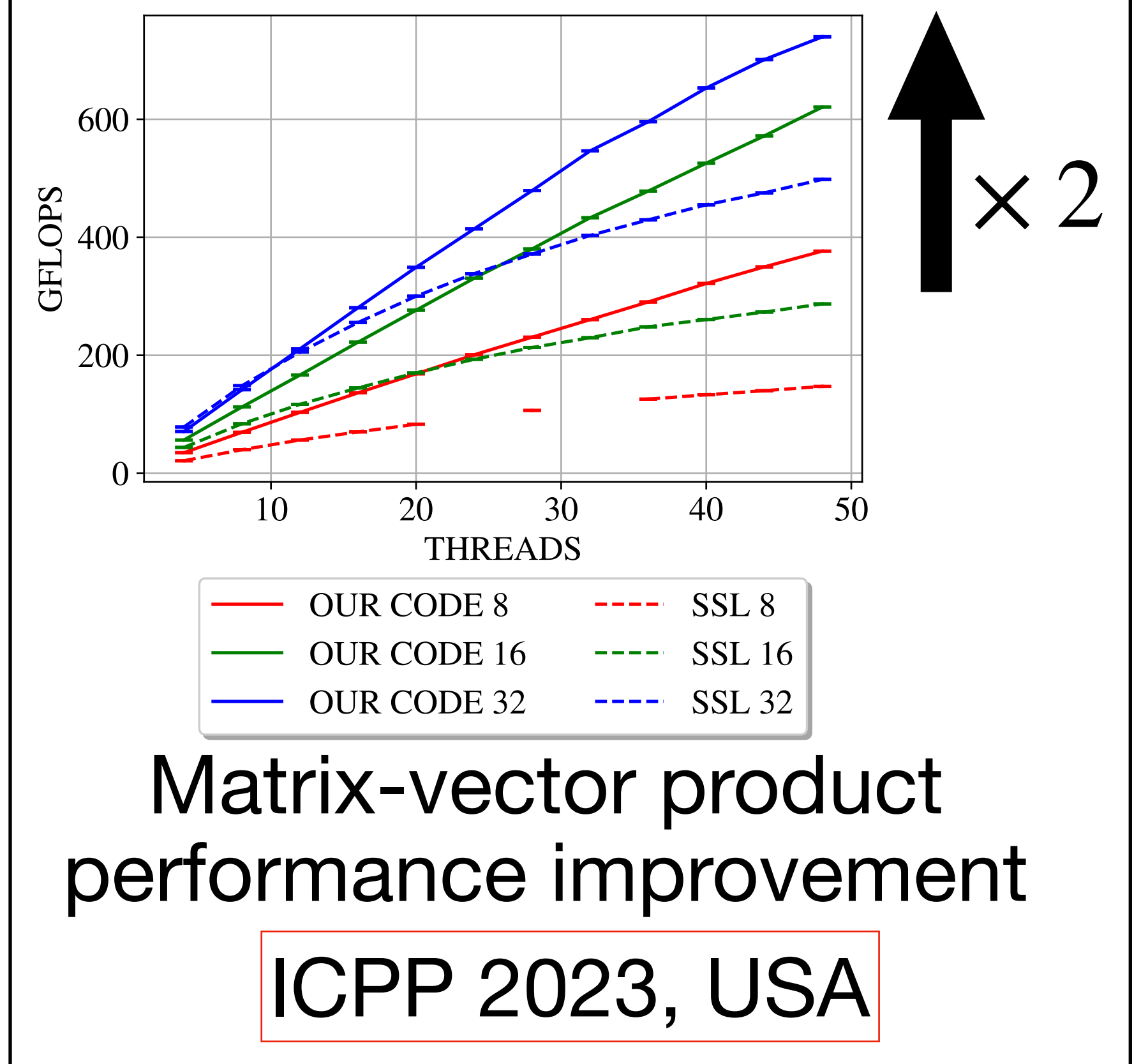
Ph.D. Research

Rio Yokota Laboratory, Tokyo Institute of Technology, Japan.

Ph.D. Research Background



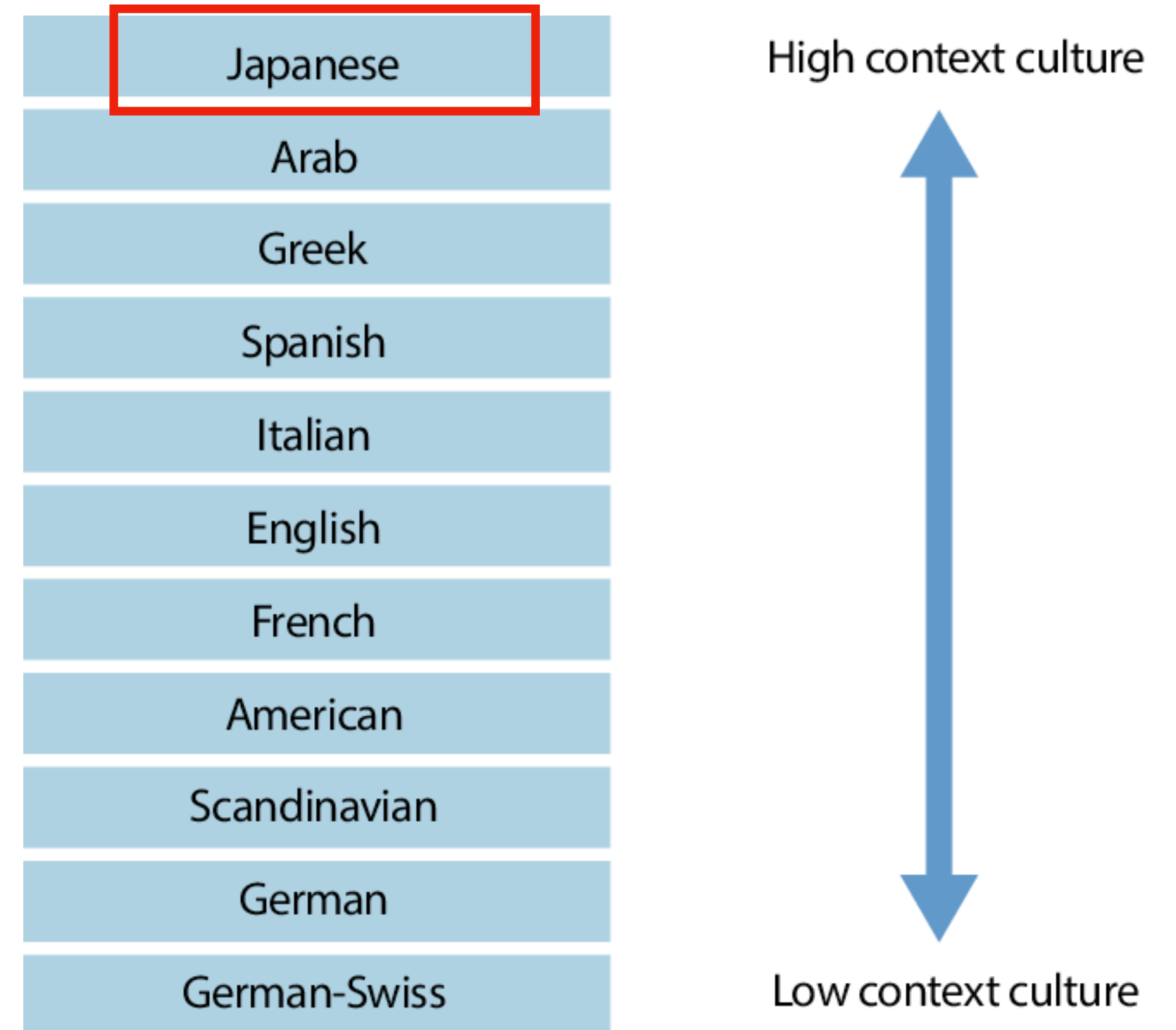
A64FX shared memory result



Communication is important in research

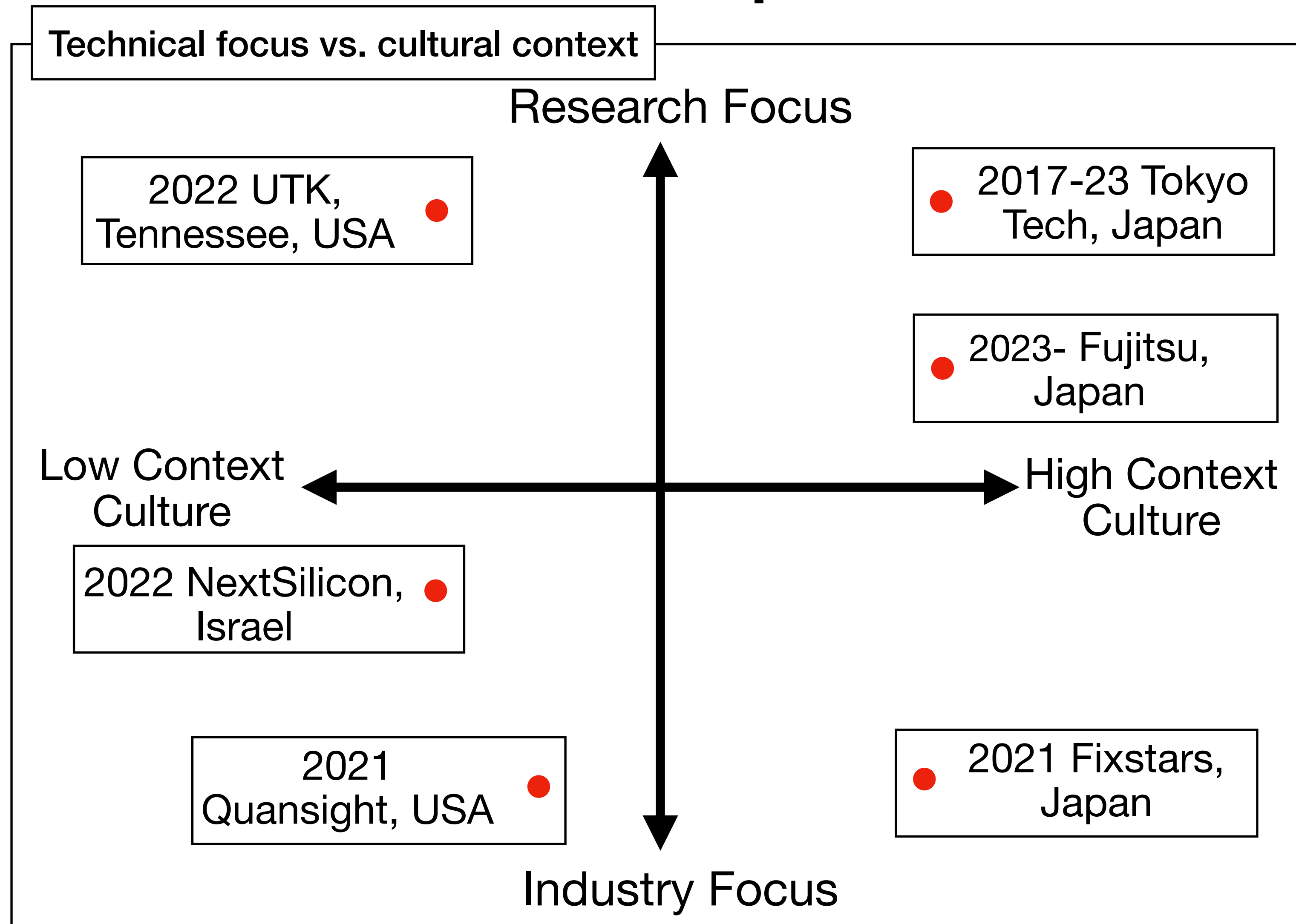
High context and low context cultural classification

A large part of your communication skill is determined by your understanding of cultural context.



My Career Map

Cultural and technical experience



Technical and culture exposure

1. Every organization has motivated people in HPC.
2. However, they communicate differently depending on the context.
3. Understanding this context is important for collaborative research.

How I can help

- Planning your life during and after graduate school.
- Getting over communication challenges.
- Improving your networking skills.
- Building long term relationships.
- Living and working in Japan.

Returning Mentor Career Lightning Talks

Tiago
Pestana

**INTERNATIONAL HPC SUMMER SCHOOL
2024**

Kobe, Japan – 7-12 July, 2024



5 countries
6 universities



- BSc Mechanical Eng. [Salvador - BRA]
* Exchange student at TU Munich, Germany (1 year)
- MSc Mechanical Eng. [Karlsruhe - GER]

- 2018 — IHPCSS [Ostrava - CZ]
- 2020 — PhD in Aerospace Engineering [Delft - NL]
* Fluid mechanics, turbulent flows
- 2020 — Became a father
- 2020 — Postdoc [Karlsruhe - GER]
* Turbulence & particles
- 2021 — Parental Leave (6 months)
- 2022 — Software Developer [Stockholm - SE]

8 applications, 3 interviews → job...

Each company is different!

- * COMSOL Multiphysics (~500 empl.)
- * Algorithms: coupled system of PDEs
- * Numerical Analysis Group
 - * > 90% holds a PhD
- * Flat hierarchy:
 - * Me → CTO → Company owner
- * Projects → free to execute
- * 30 min meeting per week

Every candidate has a PhD...

- * IHPCSS → validation
- * PhD → independence (dev. proj.)
- * PhD Board member (leadership)