

## WILEAM YONATAN PHAN

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### EDUCATION

Master of Science (MS)

August 2016 to December 2021

*Department of Physics & Astronomy, College of Arts and Sciences, University of Tennessee, Knoxville  
Knoxville, Tennessee, United States of America*

- Physics major, specializing in computational condensed-matter physics
- Thesis: "Accelerating Dynamical Density Response Code on Summit and Its Application for Computing the Density Response Function of Vanadium Sesquioxide"  
[https://trace.tennessee.edu/utk\\_gradthes/6327/](https://trace.tennessee.edu/utk_gradthes/6327/)  
Advisor: Prof. A. G. Egiluz (*University of Tennessee, Knoxville*)

Sarjana Sains (S.Si.) – equivalent to Bachelor of Science

July 2009 to May 2014

*Departemen Fisika, Fakultas Matematika dan Ilmu Pengetahuan Alam, Universitas Indonesia  
Depok, Jawa Barat, Indonesia*

- Physics major, with concentration in condensed matter physics
- Thesis: "Theoretical Study on the Effects of Substrate on the Optical Conductivity of Graphene"  
<http://lib.ui.ac.id/detail?id=20414017&lokasi=lokal>  
Co-advisors: Dr. M. A. Majidi (*Universitas Indonesia*) and Prof. A. Rusydi (*National University of Singapore*)

### INTERESTS

- High performance computing
- Accelerated computing
- Embedded systems
- Bare-metal virtualization
- Container technologies
- Continuous integration
- Performance analysis
- Numerical algorithms
- Mathematics of arrays
- Dense linear algebra
- Compiler technology
- Computational condensed-matter physics

### LANGUAGE QUALIFICATIONS

- Human languages:
  - English (fluent)
  - Bahasa Indonesia / Indonesian (native)
  - 日本語 / Japanese (intermediate)
  - 普通话 / Mandarin Chinese (elementary)
  - 客家语 / Hakka Chinese (intermediate)
  - Español / Spanish (elementary)
- Programming languages:
  - FORTRAN (66/77)
  - Modern Fortran (90/95/03/08/18/23)
  - Python
  - C
  - C++
  - Bash shell scripting
  - LaTeX
  - MathWorks MATLAB
  - Wolfram Mathematica
  - HTML
  - JavaScript
  - Ruby
  - Perl
- Programming APIs:
  - MPI
  - OpenMP
  - OpenACC
  - CUDA C/C++
  - CUDA Fortran
  - HIP/ROCM
  - DPC++/SYCL

## WORK EXPERIENCE

### Research Software Engineer I

June 2022 to present

*Department of Computer Science, George R. Brown School of Engineering, Rice University  
Houston, Texas, United States of America*

- Fully remote work
- Member of development team for HPCToolkit profiling tools, part of Exascale Computing Project (ECP)
- Lead application engagement activities to collaborate with ECP application codes
- Collect feedback on HPCToolkit usage from ECP application teams
- Serve as ECP project coordinator for the HPCToolkit project
- Maintain HPCToolkit deployments at DOE open-science leadership computing facilities
- Contribute to the research and development of HPCToolkit profiling suite for GPU-accelerated applications

### Research Software Engineer

March 2022 to present

*Sourcery Institute  
Oakland, California, United States of America*

- Part-time, independent contract work
- Isolated Fortran 2018/2023 implementation bugs in GFortran compiler and wrote reproducer codes
- Wrote Fortran 2018 standard compliance tests

### Research Assistant

March 2021 to June 2022

*Department of Computer Science, University at Albany, State University of New York  
Albany, New York, United States of America*

- Fully remote work
- Assisted the GPU porting process for codes based on Mathematics of Arrays

### Scientific Computing Software Engineer (CSE-2)

July 2021 to October 2021

*Center for Computational Sciences and Engineering, Computational Research Division,  
Lawrence Berkeley National Laboratory  
Berkeley, California, United States of America*

- Member of Adaptive Mesh Refinement for Exascale (AMReX) project, part of Exascale Computing Project (ECP)
- Ported several code components from Fortran to C++ with GPU support
- Developed unit tests, which were executed on Gigan (CCSE) and Spock (OLCF)
- Contributed to user documentation

### Graduate Research Assistant

August 2020 to July 2021

*Department of Physics & Astronomy, College of Arts and Sciences, University of Tennessee, Knoxville  
Knoxville, Tennessee, United States of America*

- Developed and ported the Eguluz research group EXCITING-PLUS density response code to use NVIDIA graphic processing units (GPUs), using OpenACC and GPU libraries (MAGMA), targeting the Summit supercomputer at Oak Ridge Leadership Computing Facility (OLCF)
- Participated in the 2020 OLCF GPU Hackathon as member of team EECM  
<https://www.olcf.ornl.gov/2020-olcf-gpu-hackathon/>
- Performed calculations with the ported code on Summit (OLCF) and Cori-GPU (NERSC)

### Academic Summer Break (UT Knoxville)

May 2020 to August 2020

### Graduate Teaching Assistant

August 2016 to May 2020

*Department of Physics & Astronomy, College of Arts and Sciences, University of Tennessee, Knoxville  
Knoxville, Tennessee, United States of America*

- Taught physics laboratory sessions (both traditional and hybrid studio methods) for the following courses
  - PHYS 221 Elements of Physics I (Fall 2017, Fall 2018, Spring 2019)
  - PHYS 222 Elements of Physics II (Spring 2017, Spring 2018, Fall 2019)
  - PHYS 231 Fundamentals of Physics I: Electricity and Magnetism (Fall 2016, Spring 2018)
- Graded for the following course:
  - PHYS 514 Problems in Theoretical Physics II (Spring 2020)

### Gap year

December 2015 to August 2016

Dedicated to standardized test preparation, graduate school applications, and securing a student visa for enrollment.

## Teaching Assistant

January 2011 to December 2015

Departemen Fisika, Fakultas Matematika dan Ilmu Pengetahuan Alam, Universitas Indonesia  
Depok, Jawa Barat, Indonesia

- Appointed for the following courses:
  - FSK 20236 Electromagnetic Fields 1 (January 2011 to June 2013)
  - SCFI 603611 Solid State Physics 1 (August 2014 to December 2015)
  - SCFI 604021 Computational Physics 2 (August 2015 to December 2015)
- Held tutorials, proctored exams, and graded homework & exams

## PROFESSIONAL MEMBERSHIPS

- American Physical Society (APS)
- Association for Computing Machinery (ACM)
- ACM Special Interest Group on High Performance Computing (SIGHPC)

## PUBLICATIONS

- Lenore M. Mullin and Wileam Y. Phan, "A Transformational Approach to Scientific Software: the Mathematics of Arrays (MoA) Fast Fourier Transform (FFT) with OpenACC", invited talk at the OpenACC Summit 2021, <https://www.openacc.org/events/openacc-summit-2021>
- MA Majidi, R Kusumaatmadja, AD Fauzi, WY Phan, A Taufik, R Saleh, and A Rusydi, "Theoretical Exploration of Optical Response of Fe<sub>3</sub>O<sub>4</sub>-reduced Graphene Oxide Nanoparticle System within Dynamical Mean-Field Theory", published in *IOP Conference Series: Materials Science & Engineering* **188**, 012055 (2017), [doi: 10.1088/1757-899x/188/1/012055](https://doi.org/10.1088/1757-899x/188/1/012055)
- MA Majidi, WY Phan, and A Rusydi, "Investigation of the Effects of the Graphene-Substrate Hybridization on the Optical Conductivity of Graphene", published in *AIP Conference Proceedings* **1729**, 020016 (2016), [doi:10.1063/1.4946919](https://doi.org/10.1063/1.4946919)
- MA Majidi, MA Naradipa, WY Phan, A Syahroni, and A Rusydi, "Development of Tight-binding Based GW Algorithm and Its Computational Implementation for Graphene", published in *AIP Conference Proceedings* **1729**, 020013 (2016), [doi: 10.1063/1.4946916](https://doi.org/10.1063/1.4946916)

## TRAINING AND WORKSHOPS GIVEN

- John Mellor-Crummey and Wileam Y. Phan, "HPCToolkit: Emerging Performance Tools for Exascale Computing", part of ECP Annual Meeting 2022 Project Tutorial Days on February 6, 2023, <https://www.exascaleproject.org/event/ecp-tutorial-days/>
- John Mellor-Crummey and Wileam Y. Phan, "December 2022 OLCF User Conference Call: HPCToolkit Overview", invited talk at Oak Ridge Leadership Computing Facility on December 14, 2022, <https://www.olcf.ornl.gov/calendar/userconcall-dec2022/>
- Wileam Y. Phan, "Towards Exascale Computing: Recent Trends in High-Performance Computing (HPC)", invited talk (in Indonesian) at Departemen Fisika Universitas Indonesia on February 9, 2022, <https://wyphan.github.io/logfile/2022/02/09/fisika-ui-talk.html>

## TRAINING AND WORKSHOPS ATTENDED

- Writing Clean Scientific Software (July 12, 2023)  
*Exascale Computing Project (ECP)* – remote participation  
<https://www.exascaleproject.org/event/cleanssw/>
- FUN Training July 2023: Modern Fortran Basics (July 10-11, 2023)  
*National Energy Research Scientific Computing Center (NERSC)* – remote participation  
<https://www.nersc.gov/users/training/events/fun-training-july-2023-modern-fortran-basics/>
- Frontier Hackathon 2023 (June 28-30, 2023)  
*Oak Ridge Leadership Computing Facility (OLCF)* – remote participation  
<https://www.olcf.ornl.gov/frontier-hackathon-june-2023/>
- Aurora COE Workshop 5 (June 13-15, 2023)  
*Argonne Leadership Computing Facility (ALCF)* – remote participation  
<https://events.cels.anl.gov/event/404/>
- Lessons Learned Developing Performance-Portable QMCPACK (May 10, 2023)  
*Exascale Computing Project (ECP)* – remote participation  
<https://www.exascaleproject.org/event/qmcpack/>

- Python - Distribution & Packaging Roundtable (May 9, 2023)  
*OpenTeams* – remote participation  
<https://hopin.com/events/python-distribution-packaging-roundtable-20230509/registration>
- Architecting for Accelerators: How to Use Intel's New, Built-in AI Acceleration Engines (March 29, 2023)  
*Intel* – remote participation
- Ookami User Group Meeting 2023 (March 23, 2023)  
*Institute for Advanced Computational Science, Stony Brook University* – remote participation  
[https://www.stonybrook.edu/commcms/ookami/user\\_meeting/UGM2023.php](https://www.stonybrook.edu/commcms/ookami/user_meeting/UGM2023.php)
- Frontier Training Workshop (February 15-17, 2023)  
*Oak Ridge Leadership Computing Facility (OLCF)* – remote participation  
<https://www.olcf.ornl.gov/calendar/frontier-training-workshop-february-2023/>
- Using HIP and GPU Libraries with OpenMP Webinar (December 14, 2022)  
*Oak Ridge Leadership Computing Facility (OLCF)* – remote participation  
<https://www.olcf.ornl.gov/calendar/preparing-for-frontier-openmp-part3/>
- Crusher User Experience Talks (December 9, 2022)  
*Oak Ridge Leadership Computing Facility (OLCF)* – remote participation  
<https://www.olcf.ornl.gov/calendar/crusher-user-experience-talks/>
- NERSC December 2022 GPU Hackathon (November 30 & December 6-8, 2022)  
*National Energy Research Scientific Computing Center (NERSC)* – remote participation  
<https://sites.google.com/lbl.gov/december2022gpuhackathon/home>
- Black Lives Count: Toward Accountability in Efforts to Diversify Computing (October 25, 2022)  
*Exascale Computing Project (ECP)* – remote participation  
<https://www.exascaleproject.org/event/blc/>
- Hierarchical Roofline Profiling on AMD GPUs Webinar (October 11, 2022)  
*Oak Ridge Leadership Computing Facility (OLCF)* – remote participation
- Solve the Mystery of Performance Profiling Webinar (September 28, 2022)  
*Intel* – remote participation
- SYCL Essentials – oneDPL Coding Webinar (September 20, 2022)  
*Intel* – remote participation
- Crusher Hackathon 4 (September 12-14, 2022)  
*Oak Ridge Leadership Computing Facility (OLCF)* – remote participation  
<https://www.olcf.ornl.gov/crusher-hackathon-4/>
- Software Packaging Webinar (September 7, 2022)  
*Exascale Computing Project (ECP)* – remote participation  
<https://www.exascaleproject.org/event/softwarepackaging/>
- Focus on Ally Skills Webinar (August 30, 2022)  
*Exascale Computing Project (ECP)* – remote participation  
<https://www.exascaleproject.org/event/focus-on-ally-skills/>
- What Can Be Learned from Applying Team of Teams Principles to the ECP projects PETSc, Trillinos, xSDK, and E4S? (August 25, 2022)  
*Exascale Computing Project (ECP)* – remote participation  
<https://www.exascaleproject.org/event/team-of-teams1/>
- Understanding GPU Register Pressure Webinar (August 22, 2022)  
*Oak Ridge Leadership Computing Facility (OLCF)* – remote participation
- SYCL Essentials – oneAPI Advanced Concepts Webinar (August 18, 2022)  
*Intel* – remote participation
- SYCL Essentials – oneAPI Introduction Webinar (July 26, 2022)  
*Intel* – remote participation
- Introduction to Slingshot (July 13, 2022)  
*Exascale Computing Project (ECP)* – remote participation
- Introduction to the Frontier Supercomputer Webinar (July 12, 2022)  
*Oak Ridge Leadership Computing Facility (OLCF)* – remote participation  
<https://www.olcf.ornl.gov/calendar/introduction-to-the-frontier-supercomputer/>
- Profiling Deep Learning Applications with NVIDIA Nsight Webinar (June 30, 2022)  
*Argonne Leadership Computing Facility (ALCF)* – remote participation  
<https://www.alcf.anl.gov/events/profiling-deep-learning-applications-nvidia-nsight>

- 14<sup>th</sup> Scalable Tools Workshop (June 19-23, 2022)  
Lake Tahoe, California, United States of America  
[https://dyninst.github.io/scalable\\_tools\\_workshop/petascale2022/](https://dyninst.github.io/scalable_tools_workshop/petascale2022/)
- Crash Course in Supercomputing Workshop (June 14, 2022)  
*National Energy Research Scientific Computing Center (NERSC)* – remote participation  
<https://www.nersc.gov/users/training/events/crash-course-in-supercomputing-jun2022/>
- Graviton2 Arm vs Intel x86: Comparing the Performance of Graviton-based Systems vs x86 Hardware for Real-time Streaming Data Applications Webinar (June 8, 2022)  
*Linux Foundation* – remote participation  
<https://www.linuxfoundation.org/webinars/graviton2-arm-vs-intel-x86/>
- How to be a Great Mentor Webinar (May 24, 2022)  
*Exascale Computing Project (ECP)* – remote participation  
<https://www.exascaleproject.org/event/mentor/>
- Coding for GPUs Using Standard Fortran Webinar (May 13, 2022)  
*Oak Ridge Leadership Computing Facility (OLCF)* – remote participation  
<https://www.olcf.ornl.gov/calendar/coding-for-gpus-using-standard-fortran/>
- Coding for GPUs Using Standard C++ Webinar (April 7, 2022)  
*Oak Ridge Leadership Computing Facility (OLCF)* – remote participation  
<https://www.olcf.ornl.gov/calendar/coding-for-gpus-using-standard-c/>
- 8<sup>th</sup> BerkeleyGW Tutorial Workshop (January 10-12, 2022)  
*Lawrence Berkeley National Laboratory (LBL)* – remote participation  
<https://workshop.berkeleygw.org/>
- Using Perlmuter Training Workshop (January 5-7, 2022)  
*National Energy Research Scientific Computing Center (NERSC)* – remote participation  
<https://www.nersc.gov/users/training/events/using-perlmutter-training-jan2022/>
- ECP CMake Training Workshop (August 23-26, 2021)  
*National Energy Research Scientific Computing Center (NERSC)* – remote participation  
<https://www.nersc.gov/users/training/events/ecp-cmake-training-aug-2021/>
- Introduction to CI at NERSC Training (July 7, 2021)  
*National Energy Research Scientific Computing Center (NERSC)* – remote participation  
<https://www.nersc.gov/users/training/events/introduction-to-ci-at-nersc-july-7-2021/>
- Perlmuter Introduction Training (June 2, 2021)  
*National Energy Research Scientific Computing Center (NERSC)* – remote participation  
<https://www.nersc.gov/users/training/events/perlmutter-introduction-june-2021/>
- HIP Training Workshop (May 24-26, 2021)  
*Oak Ridge Leadership Computing Facility (OLCF)* – remote participation  
<https://www.olcf.ornl.gov/calendar/2021hip>
- Automated Fortran-C++ Bindings for Large Scale Scientific Applications (May 12, 2021)  
*Exascale Computing Project* – remote participation  
<https://www.exascaleproject.org/event/fortran-cpp-bindings/>
- AMD EPYC Advanced User Training on Expanse (April 21, 2021)  
*San Diego Supercomputing Center (SDSC)* – remote participation through NSF XSEDE  
<https://www.xsede.org/web/xup/course-calendar/-/training-user/class/2311>
- Using HPCToolkit to Measure and Analyze the Performance of GPU-accelerated Applications Tutorial (March 29 & April 2, 2021)  
*National Energy Research Scientific Computing Center (NERSC)* – remote participation  
<https://www.nersc.gov/users/training/events/hpctoolkit-for-gpu-tutorial-mar-apr-2021>
- Introduction to Ookami Webinar (March 3, 2021)  
*Institute for Advanced Computational Science, Stony Brook University* – remote participation
- Good Practices for Research Software Documentation Webinar (February 10, 2021)  
*Exascale Computing Project* – remote participation  
<https://ideas-productivity.org/events/hpc-best-practices-webinars/#webinar049>
- Extreme-scale Scientific Software Stack (E4S) Webinar (January 13, 2021)  
*Exascale Computing Project* – remote participation  
<https://www.exascaleproject.org/event/e4s-210113/>
- Totalview Tutorial (December 9, 2020)  
*National Energy Research Scientific Computing Center (NERSC)* – remote participation  
<https://www.nersc.gov/users/training/events/totalview-tutorial-december-9-2020/>

- 2020 OLCF GPU Hackathon (October 19 & 26-28, 2020)  
*Oak Ridge Leadership Computing Facility (OLCF)* – remote participation  
<https://www.olcf.ornl.gov/2020-olcf-gpu-hackathon/>
- CUDA Training Series (January - September 2020; July - October 2021)  
*Oak Ridge Leadership Computing Facility (OLCF)* – remote and on-site participation  
<https://www.olcf.ornl.gov/cuda-training-series/>
- Testing and Code Review Practices in Research Software Development Webinar (September 9, 2020)  
*Exascale Computing Project* – remote participation  
<https://www.exascaleproject.org/event/testing-and-code-review/>
- TAU Performance Analysis Training (July 28, 2020)  
*Oak Ridge Leadership Computing Facility (OLCF)* – remote participation  
<https://www.olcf.ornl.gov/calendar/tau-performance-analysis-training/>
- Arm Debugging and Profiling Tools Tutorial (July 16, 2020)  
*National Energy Research Scientific Computing Center (NERSC)* – remote participation  
<https://www.nersc.gov/users/training/events/arm-debugging-and-profiling-tools-tutorial-june-25-2020/>
- OpenACC Training Series (April - June 2020, once a month)  
*Oak Ridge Leadership Computing Facility (OLCF)* – remote participation  
<https://www.olcf.ornl.gov/openacc-training-series/>
- NVIDIA Profiling Tools – Nsight Compute Training (March 10, 2020)  
*Oak Ridge Leadership Computing Facility (OLCF)* – remote participation  
<https://www.olcf.ornl.gov/calendar/nvidia-profiling-tools-nsight-compute/>
- NVIDIA Profiling Tools – Nsight Systems Training (March 9, 2020)  
*Oak Ridge Leadership Computing Facility (OLCF)* – remote participation  
<https://www.olcf.ornl.gov/calendar/nvidia-profiling-tools-nsight-systems/>
- Programming for Advanced Architectures on Stampede2 Training (October 31, 2018)  
*Texas Advanced Computing Center (TACC)* – remote participation through NSF XSEDE  
<https://portal.xsede.org/course-calendar/-/training-user/class/880>
- Workshop Klaster Komputer 2013 (December 11-13, 2013)  
*Lembaga Ilmu Pengetahuan Indonesia (LIPI), Bandung, Jawa Barat, Indonesia*  
<http://situs.opi.lipi.go.id/wkk2013/>