

Hoang Anh (Benjamin) NGUYEN

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RESEARCH INTERESTS

Geophysics, Computational Math, and Quantum Computing:

- Full waveform inversion (FWI)
- Partial differential equation and optimization
- Deep learning and physics-informed neural network (PINNs)
- Atomistic simulations
- Large-scale behavior of the Earth

EDUCATION

Ph.D. of Geophysics | *Major: Geophysics - Minor: Computer Science* Aug 2023 – Present
Colorado School of Mines (CSM) Golden, CO, USA

Pre-Ph.D. of Earth Sciences | *Major: Earth System Physics* Sept 2022 – Sept 2023
International Centre for Theoretical Physics (ICTP) - UNESCO Trieste, Italy
Thesis: Ambient noise Tomography beneath the Banda Arc
GPA: 3.68/4.00

Master of Engineering Physics | *Major: Computational Physics* April 2021 – April 2023
Hanoi University of Science and Technology (HUST) Hanoi, Vietnam
Thesis: Structural Simulation of MgSiO₃ under Compression
GPA: 3.89/4.00

Engineer of Engineering Physics | *Major: Computational Physics* Sept 2016 – April 2021
Talent Honours Program – HUST Hanoi, Vietnam
Thesis: Computational Modelling of Microstructure of Magnesium Silicate
GPA: 3.33/4.00

WORK AND RESEARCH EXPERIENCE

Research Assistant Aug 2023 – Present
Department of Geophysics - CSM Advised by Prof. A. Tura

- Elastic FWI - Devito
- Seismic inversion with quantum computing and PINNs

RCP Seismic Immersive Lab Admin Aug 2024 – Present
Reservoir Characterization Project (RCP) - CSM Advised by L. Irons

- Managing data, licenses, OS systems and software

Research Assistant May 2023 – Sept 2023
Earth System Physics - ICTP Advised by Prof. A. Aoudia & Dr. D. Manu-Marfo

- Ambient noise tomography

Research Assistant July 2018 – July 2023
Department of Computational Physics - HUST Advised by Prof. V. H. Nguyen

- Molecular dynamics simulation

R&D Intern Aug 2021 – Feb 2022
Geophysics Division - Vietnam Petroleum Institute Advised by Dr. Q. M. Ta

- 2D and 3D ray-tracing
- High performance computing

ACADEMIC ACTIVITIES

RCP Sponsor Meeting Seismic Inversion with Quantum Computing (Report - No confidential data)	April 2024 Golden, CO
Erasmus Master Exchange Program Physics of Complex Systems - Polytechnic University of Turin (POLITO)	Feb 2022 – July 2022 Torino, Italy
Student Scientific Research Conference of HUST Presentation: Study on Structure of Magnesium Silicate Material under Densification	May 2020 Hanoi, Vietnam
Vietnam Robot National Contest Team member of HUST	May 2019 Hanoi, Vietnam

HONORS AND AWARDS

Fully funded scholarship for postgraduate program at ICTP 2023

VEF 2.0 Program recommended candidate 2023

The [VEF 2.0 Program](#) is conducted by the Fellows and Scholars of the Vietnam Education Foundation (VEF) – an independent U.S. Federal Government agency created by the U.S. Congress

Erasmus+ scholarship for the master exchange program at POLITO 2022

Fully funded scholarship for the master program at HUST 2021, 2022

Certificate of Merit from School of Engineering Physics for undergraduate students

Excellent Student in Autumn Semester 2017, Spring Semester 2018, Autumn Semester 2018, Spring Semester 2019

Vietnam National Student Physics Olympiad XX 2018 - Second Prize

Lawrence S.Ting Scholarship 2017 for undergraduate students

CURRENT WORK & PUBLICATIONS

- **H. A. Nguyen** and A. Tura. Seismic Traveltime Inversion with Quantum Annealing. *Sci. Rep.*, 2024, (Passed through the review stage - [Preprint](#))
- V. H. Nguyen and **H. A. Nguyen**. Crystallization of Liquid SiO₂ under Compression: A Molecular Dynamics Simulation. *Pramana - J. Phys.*, 2024, doi: [10.1007/s12043-024-02839-7](#)
- **H. A. Nguyen** and V. H. Nguyen. Study the structure of MgSiO₃ system under compression by using ring statistics and Voronoi analysis. *Physica Scripta*, 2023, doi: [10.1088/1402-4896/acc5b7](#)
- V. H. Nguyen, **H. A. Nguyen**, T. Iitaka, T. L. Mai. Computer simulation of phosphate-silicate and calcium phosphate-silicate systems. *Physica Scripta*, 2023, doi: [10.1088/1402-4896/acd4fb](#)
- **H. A. Nguyen**, H. S. Nguyen and V. H. Nguyen. Pressure-induced glassy networks of enstatite (MgSiO₃) and forsterite (Mg₂SiO₄), 2022. *VNU J. Sci. Math. - Phys.*, 2023, doi: [10.25073/2588-1124/vnumap.4767](#)
- T. H. A. Pham, H. H Doan, Q. M. Ta, T. L. Mai, and **H. A. Nguyen**. Some results of seismic travel-time reflection tomography study. *Petrovietnam J.*, 10:4 –16, 2021, doi: [10.47800/PVJ.2021.10-01](#)
- H.S. Nguyen, **H. A. Nguyen**, H. K. Pham, T. Iitaka, and V. H. Nguyen. Topology of SiO_x -units and glassy network of magnesium silicate glass under densification: correlation between radial distribution function and bond angle distribution. *M. Simul. Mater. Sci. Eng.*, 2020, doi: [10.1088/1361-651X/ab9bb4](#)
- H.S. Nguyen and **H. A. Nguyen**. Structural simulation of Mg₂SiO₄ under compression. *VNU J. Sci. Math - Phys*, 2020, doi: [10.2138/am-2000-1015](#)