

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 <i>Major: Geophysics - Minor: Computer Science</i> Colorado School of Mines (CSM)	Aug 2023 – Present Golden, CO, USA
Post-grad Diploma of Earth Sciences <i>Major: Earth System Physics</i> International Centre for Theoretical Physics (ICTP) - UNESCO Thesis: Ambient noise Tomography beneath the Banda Arc	Sept 2022 – Aug 2023 Trieste, Italy
Master of Engineering Physics <i>Major: Computational Physics</i> Hanoi University of Science and Technology (HUST) Thesis: Structural Simulation of MgSiO ₃ under Compression	May 2021 – Sept 2023 Hanoi, Vietnam
Engineer of Engineering Physics <i>Major: Computational Physics</i> Talent Honours Program – HUST Thesis: Computational Modelling of Microstructure of Magnesium Silicate	Sept 2016 – April 2021 Hanoi, Vietnam

RESEARCH EXPERIENCE

Research Assistant Department of Geophysics - CSM	Aug 2023 – Present Advised by Prof. A. Tura
<ul style="list-style-type: none">• Elastic FWI - Devito• Seismic inversion with quantum computing and PINNs• Parallel computing - Language: Python/Julia	
RCP Seismic Immersive Lab Support Reservoir Characterization Project (RCP) - CSM	Aug 2024 – Present Advised by L. Irons
<ul style="list-style-type: none">• Admin privilege: managing data, licenses, OS systems and software	
Research Assistant Earth System Physics - ICTP	May 2023 – Aug 2023 Advised by Prof. A. Aoudia & Dr. D. Manu-Marfo
<ul style="list-style-type: none">• Ambient noise tomography• Nonlinear inversion• Parallel computing - Language: Python/Fortran	
Research Assistant Department of Computational Physics - HUST	Aug 2018 – July 2023 Advised by Asst. Prof. V. H. Nguyen
<ul style="list-style-type: none">• Molecular dynamics simulation• Parallel computing - Language: C/Matlab	

WORK EXPERIENCE

Geophysics R&D Intern

TGS

May 2025 – Aug 2025

Houston, TX

- Dynamic Matching FWI - Devito Pro - Language: Python

Geophysics R&D Intern

Vietnam Petroleum Institute

Aug 2021 – Feb 2022

Hanoi, Vietnam

- 2D and 3D ray-tracing with Madagascar
- Seismic travel time inversion - Language: C/Matlab

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 Fall Semester 2017, Spring Semester 2018, Fall 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**, M. Daniel, A. Abdelkrim. Ambient Noise Tomography beneath the Banda Basin reveals new insights into the Arc-Continent Collision Zone. *Geophys. Res. Lett.*, 2025. Under review
- **H. A. Nguyen** and A. Tura. Seismic Traveltime Inversion with Quantum Annealing. *Sci. Rep.*, 2025. Under revision - preprint: <https://arxiv.org/abs/2412.06611>
- V.H. Nguyen, T.D. Pham, **H.A. Nguyen**, T.L. Mai. Molecular Dynamics-Based Analysis of Cavity Distribution in GeoO2 Glass: A Novel Computational Method ([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](https://doi.org/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](https://doi.org/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](https://doi.org/10.1088/1402-4896/acd4fb)

- **H. A. Nguyen**, H. S. Nguyen and V. H. Nguyen. Pressure-induced glassy networks of enstatite and forsterite, 2022. *VNU J. Sci. Math. - Phys.*, 2023, doi: [10.25073/2588-1124/vnumap.4767](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/10.2138/am-2000-1015)