Hoang Anh (Benjamin) NGUYEN

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Research Interests

Computational modeling in Geophysics and Materials Science:

- Full waveform inversion, quantum programming
- Inverse problems, large-scale behavior of the Earth
- Atomistic simulations, properties of materials under extreme conditions

Education

Ph.D. of Geophysics | ***Major: Geophysics*** — Aug 2023 – Present
Colorado School of Mines — 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

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

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

Work and Research Experience

Research Assistant (RA) — Aug 2023 – Present
Department of Geophysics - Colorado School of Mines — Advised by Prof. Ali TURA
- Viscoelastic full waveform inversion (FWI)
- Quantum computing in Seismic Inversion

Research Assistant — May 2023 – Sept 2023
Earth System Physics - ICTP — Advised by Prof. Abdelkrim AOUDIA & Dr. Daniel MANU-MARFO
- Study ambient noise tomography

Research Assistant — July 2018 – July 2023
Department of Computational Physics - HUST — Advised by Assoc. Prof. Van Hong NGUYEN
- Study atomistic interactions

R&D Intern — Aug 2021 – Feb 2022
Geophysics Division - Vietnam Petroleum Institute (VPI) — Advised by Dr. Quang Minh TA
- Study seismic signal acquisition problems and processing algorithms
- Build 2D and 3D raytracing packages
- Participate in building servers for high performance computing

Projects

Quantum Computing in Inversion - Project — Present
Colorado School of Mines — Golden, CO, USA

3D Seismic Illumination Technology applied in Explosion-Collection Design — Sept 2021
VPI — Hanoi, Vietnam

Study on Multi-component Oxide Materials on the basis of Silicon Dioxide — Sept 2020
HUST — Hanoi, Vietnam

Academic Activities

Erasmus Master Exchange Program | *Section: Physics of Complex Systems* — Feb 2022 – July 2022
Polytechnic University of Turin (POLITO) — Torino, Italy

Student Scientific Research Conference of HUST — May 2020
Presentation: Study on Structure of Magnesium Silicate Material under Densification — Hanoi, Vietnam

Honors and Awards

Fully funded scholarship for pre-PhD program at ICTP
Scholarship for academic year 2022-2023

VEF 2.0 Program recommended candidate 2022
Who passed 2 interview/review rounds with leading Vietnamese academics, who are PhD from top U.S. graduate schools and U.S. professors. 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

Fully funded scholarship for master program at HUST
Scholarship for academic year 2021-2023

Fully funded scholarship for master exchange program at POLITO
Scholarship for the spring semester of academic year 2022-2023

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 Physics Olympiad 2018
Second Prize

Lawrence S.Ting Scholarship 2017 for undergraduate students
Scholarship for academic year 2018-2019

Other Activities and Certifications

Vietnam Robot National Contest — 2019
Team member of BK Star - the team represents for HUST — Hanoi, Vietnam

Work & Publications

- **Nguyen Hoang Anh**, Daniel Manu-Marfo, Abdelkrim Aoudia. Ambient noise tomography beneath the Banda Arc, (**In preparation**)
- Emmanuel L. C. VI M. Plan, Nguyen Van Yen, **Nguyen Hoang Anh**, Pham Huu Kien, Nguyen Van Hong and Haidang Phan. Study of microstructure and three-phase model in the correlation to the network structure of a GeO2 liquid by molecular dynamics simulation, (**In preparation**)
- **Nguyen Hoang Anh** and Nguyen Van Hong. Molecular Dynamics Simulation: Crystallization of Liquid SiO2 under Compression. *Journal of Non-crystalline Solid*, (**Under Review**)
- **Nguyen Hoang Anh** and Nguyen Van Hong. Study the structure of MgSiO3 system under compression by using ring statistics and Voronoi analysis. *Physica Scripta*, March, 2023, doi: 10.1088/1402-4896/acc5b7
- Hong Nguyen Van, Toshiaki Iitaka, Lan Thi Mai, **Nguyen Hoang Anh**. Computer simulation of phosphate-silicate and calcium phosphate-silicate systems. *Physica Scripta*, May, 2023, doi: 10.1088/1402-4896/acd4fb
- **Nguyen Hoang Anh**, Nguyen Hung Son and Nguyen Van Hong. Pressure-induced glassy networks of enstatite (MgSiO3) and forsterite (Mg2SiO4), 2022. *VNU Journal of Science: Mathematics - Physics*, March, 2023, doi: 10.25073/2588-1124/vnumap.4767

- The Hoang Ha Pham, Huy Hien Doan, Quang Minh Ta, Thi Lua Mai, and **Hoang Anh Nguyen**. Some results of seismic travel-time reflection tomography study. *Petrovietnam Journal*, 10:4 –16, Nov. 2021, doi: 10.47800/PVJ.2021.10-01

- Nguyen Hung Son, **Nguyen Hoang Anh**, Pham Huu Kien, Toshiaki Iitaka, and Nguyen Van Hong. Topology of SiOx -units and glassy network of magnesium silicate glass under densification: correlation between radial distribution function and bond angle distribution. *Modelling and Simulation in Materials Science and Engineering*, 28(6):065007, Jul. 2020, doi: 10.1088/1361-651X/ab9bb4

- Nguyen Hung Son and **Nguyen Hoang Anh**. Structural simulation of Mg2SiO4 under compression. *VNU Journal of Science: Mathematics - Physics*, 36(4), Nov. 2020, doi: 10.2138/am-2000-1015