AKASH NAIR

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Edmonton, Canada

EDUCATION

2023 – present	**Ph.D. Geophysics**	**Grade: 4.0/4.0**

Signal Analysis and Imaging Group, University of Alberta, Canada
Supervisor: Prof. Mauricio D. Sacchi
Thesis: *Underground CO_2 Monitoring using Seismic Signal Analysis and Machine Learning*

2021-2023	**M. Sc. Geophysics**	**Grade: 9.86/10**

Indian Institute of Technology Kharagpur, West Bengal, India
Thesis: *Reservoir Characterization and Capacity Calculation for CO_2 Storage using AI/ML Techniques in Gandhar field, Cambay Basin, India*

2018-2021	**B.Sc. (Hons.) Geology**	**Grade: 9.493/10**

Ram Lal Anand College, University of Delhi, India

AWARDS & ACHIEVEMENTS

1. **Prof. J.C. Bose Memorial Gold Medal** for securing the highest marks among all outgoing M.Sc. students. [Awarded by the Smt. Droupadi Murmu, Hon'ble President of India]
2. **Institute Silver Medal** for securing the highest marks in the class of M.Sc. Geophysics.
3. **Kirttan B. Behera Best All-rounder Student Award** for demonstrating the best all-round performance based on Academics, Cultural activities, Art, Sports and Games, Student Activities, and Leadership among all 2nd-year graduates of IIT Kharagpur.
4. **Prof. Amitabha Chakrabarti Memorial Award** for securing the highest marks in the Department of Geology and Geophysics in Master of Science.
5. **Institute Endowment Award for Best Thesis** in M.Sc. Geophysics
6. **University Gold Medal** for securing the highest marks among all university students of B.Sc. (Hons.) Geology.
7. **Graduate Recruitment Scholarship by the University of Alberta**
8. **L. Austin Weeks Undergraduate Grant Program Scholarship**
9. **Class X Delhi Zonal Topper** [Awarded by Shri Manish Sisodia, Education Minister of NCT of Delhi, and Shri Pinarayi Vijayan, Hon'ble Chief Minister of Kerala]

INTERNSHIPS

1. **Effect of plumes on transition zone: Insights from 3D migration**
   National Centre for Earth Science Studies, Thiruvananthapuram, Kerala, India
   December 2021 – June 2022 [7 months]
   Supervisor: Dr. Padma Rao Bommoju, Scientist, NCESS

   - Performed a literature survey to understand the effect of the Reunion hotspot on the transition zone.
   - Computed P- Receiver Functions and Differential Slowness Stacks.
   - Performed Quality Checks of more than 16,000+ Receiver Functions.
   - Co-authored a scientific paper

2. **Enhancement of Livelihood Opportunities through Sustainable Development using Multifaceted Support Plans for Village Cluster around Patiya in Takula Block, Almora District, Uttarakhand**
   National Mission on Himalayan Studies, Ministry of Environment, Forest and Climate Change, Govt. of India
   October 2019 – March 2020 [6 months]
   Principal Investigator: Dr. Seema Gupta, Associate Professor, Department of Statistics, Ram Lal Anand College
   - Responsible for effectively coordinating surveys to collect demographic data and understand the problems Himalayan villages face towards sustaining and enhancing the ecological, natural, cultural, and socio-economic capital assets and values.
   - Proposed a geo-excursion site in the villages of Almora District, Uttarakhand, by conducting geological field trips.

PROJECTS

1. **Reservoir Characterization and Capacity Calculation for CO_2 storage using AI/ML in Cambay Basin, India**

    [Aug '22 – May '23]

    Supervisors:
    1. Dr. William Kumar Mohanty, Professor, Indian Institute of Technology Kharagpur, India
    2. Dr. Srikumar Roy, Senior Research Scientist, Irish Centre for Research in Applied Geosciences, Ireland

    - Conventional Reservoir characterization, seismic interpretation, analysis, and seismic-to-well tie.
    - Proposed three machine-learning-assisted models for reservoir characterization
    - Calculated theoretical and effective CO_2 storage capacity of the Gandhar oil field

2. **ProGrav: Software Development for gravity and magnetic survey data correction, enhancement, visualization, and inversion.** **[Since 2022]**

    Supervisor: Dr. William Kumar Mohanty, Professor, IIT Kharagpur, India

    Co-Developer and Content-writer

3. **Inversion of VLF data to obtain dimensions of a subsurface conductor** **[Jan-Mar 2022]**

    Supervisor: Dr. Chandrani Singh, Associate Professor, IIT Kharagpur

    Used Tikhonov Regularization to obtain the model parameter and Very Fast Simulated Annealing method to verify the results.

TRAINING

1. **Paradigm 18(Echos) Software Training** **[April 2022]**

    Seismic Imaging Centre, Banaras Hindu University
    Got acquainted with seismic data processing steps like geometry loading, noise attenuation, deconvolution, migration, etc.

2. **Emerging Approaches in Earthquake Occurrences and Risks** **[July 2022]**

    IIT Gandhinagar
    Hands-on training in MATLAB and Python & completed a group project on 'Studying earthquake sequence using heat flow data.'

3. **Geological Field Training** **[Sept-Dec 2019]**

    Ram Lal Anand College
    Basic field training, geological mapping, lithology, and structure identification fieldwork in the Himalayan foothills of Mussoorie (Sept), Almora (Oct and Dec), and Nainital (Dec)

TEACHING EXPERIENCE

- Courses taught in B.Sc. Engineering Program at the University of Alberta:
  EN PH 131 Mechanics Lab **[2024]**
  PHYS 130 Waves, Optics and Sound Lab and PHYS 130 Lect Tutorial Support **[2023]**

- Tutored Class X-XII students in Mathematics, Physics, Biology, and Chemistry **[2018-21]**

POSITIONS OF RESPONSIBILITY

- **President**, SEG IIT Kharagpur Student Chapter [2022-23]
- **President and Vice-President**, Terre-X, Geological Society, Ram Lal Anand College [2020-21 and 2019-20]
- **Head Boy**, Kerala School, S.M.S. Marg, Delhi [2017-18]

SKILLS

Programming Languages: Julia, MATLAB, Python, C, and Shell-scripting
Technical Software: HampsonRussell, Paradigm 18 (Echos), GMT, Google Earth Pro, and OpendTect

Operating Systems: Windows and Linux
Markup: LaTeX
Other tools: Google Colab, GitHub, Jupyter Notebooks, LibreOffice Suite, and MS Office Suite

LANGUAGES

Native: Malayalam
Advanced: English and Hindi
Beginner: German, Tamil, and Bengali

CERTIFICATIONS

- Machine Learning A-Z™: Hands-On Python & R In Data Science, Udemy
- Signal Processing using MATLAB
- Seismic Tomography, Novosibirsk State University, Coursera
- Oil & Gas Industry Operations and Markets, Duke University, North Carolina, Coursera
- Natural Hazards, NPTEL, IIT KANPUR [**Top 1 % of Certified Candidates**]
- Structural Geology, NPTEL, IIT KANPUR
- Overview of Planetary Geosciences with special emphasis on Moon and Mars, IIRS, ISRO, Department of Space, Govt. of India
- Remote Sensing Applications in Agricultural Water Management, IIRS, ISRO, Department of Space, Govt. of India
- Online GIS Training Program using QGIS, Central University of Karnataka
- Planetary Geodesy – Past Discoveries and Future Possibilities, W.M. Keck Institute of Space Studies
- Reiki Degree I Usui Shiki Ryoho

COMPETITIONS

- II Position in Extempore Competition, Banaras Hindu University
- III Position in Environment Group Discussion competition, IIT(ISM) Dhanbad
- III Position in Geophysics Quiz competition, IIT(ISM) Dhanbad
- Delhi State English Essay Writing Competition Winner, CBSE

EXTRACURRICULAR ACTIVITIES

Environmentalism | Public Speaking | Anchoring | Writing | Hip-hop music | Badminton

REFERENCES

1. **Prof. Mauricio D. Sacchi**   Professor, Department of Physics, University of Alberta
   E-mail: msacchi@ualberta.ca   Contact: +1 (780) 492-1060

2. **Dr. William Kumar Mohanty**   Professor, Department of Geology and Geophysics, IIT Kharagpur
   Head, Deysarkar Centre of Excellence in Petroleum Engineering, IIT Kharagpur
   E-mail: wkmohanty@gg.iitkgp.ac.in   Contact: +91-3222-283360

3. **Dr. Paresh Nath Singha Roy** Professor, Department of Geology and Geophysics, IIT Kharagpur
   E-mail: pareshsr@gg.iitkgp.ac.in   Contact: +91-3222-281790