

SHUBHAM JAIN

University of British Columbia (UBC), Vancouver, Canada
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SUMMARY

Materials Engineer specialized in ceramics, construction materials and hazardous waste immobilization with 10+ years of research experience in diverse multidisciplinary projects. Skilled in planning and leading collaborative projects, as lab manager, teaching, training/mentoring new researchers, and supervising lab safety.

RESEARCH POSITIONS

Postdoctoral Research Fellow, Civil Engineering Department, The University of British Columbia

Supervisor: Professor Nemkumar (Nemy) Banthia, Sustainable Infrastructure Research Group (SIERA) 01.2023-current

Research: Cement-based/geopolymer composites for bio-corrosion resistance in sewage pipelines

- NSERC Alliance Project (*Industry Partners: Metro Vancouver Group, Metro Testing Group and Avestec*)
- Developing low-carbon materials and their placement technologies as a repair coating, which can cost-effectively prolong the lifespan of sewer infrastructure through enhanced resistance to Microbial Induced Corrosion (MIC)

Editorial work: Assist in the editorial process for the Journal of Cement and Concrete Composites

Highly Qualified Personnel, IC-IMPACTS Research Centre of Excellence

09.2017-current

- Acquired advanced academic qualifications, specialized skills, and in-depth knowledge necessary to conduct research and development activities in specific areas of focus

Postdoctoral Teaching Fellow, Materials Engineering Department, The University of British Columbia

01.2023-04.2023

- Supervision of the undergraduate ceramic labs and mentoring teaching assistants

EDUCATIONAL QUALIFICATION

Ph.D., Materials Engineering, The University of British Columbia

09.2016 – 12.2022

- Scholarships/award: SERB-UBC doctoral scholarship, J Keith Brimacombe memorial scholarship, John S. Nadeau memorial scholarship, President's academic excellence initiative Ph.D. award
- Sessional average of courses: **91.4%**

Indian Institute of Technology, Varanasi (IIT BHU, Varanasi)

2010 - 2015

B. Tech. + M. Tech. in Ceramic Engineering, GPA: 8.0/10.0, **Ranked 2nd** in graduating class

Ph.D. RESEARCH EXPERIENCE (Materials Engineering, UBC, Vancouver, Canada)

Thesis: Fly ash-based geopolymers for immobilization of nuclear waste containing cesium

Supervisors: Professor Tom Troczynski and Professor Nemkumar Banthia

09.2016 - 12.2022

Specialization: Ceramics, Sustainable cementitious materials, Leaching, Waste management

- Investigated the effects of process parameters on the geopolymer's synthesis, microstructure, phase compositions, and cesium immobilization using factorial experimental design and ANOVA
- Studied the kinetics of zeolite crystallization in FA-GP systems and established its relation to Cs immobilization
- Achieved significantly enhanced Cs immobilization via a one-step synthesis and chemical route
- Published two peer-reviewed papers as first and corresponding author in **Journal of Cleaner Production** and **Journal of cement and concrete composites** and one book chapter in **Advances in the Toxicity of Construction and Building Materials**

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INTERNSHIPS AND PROFESSIONAL RESEARCH EXPERIENCE

JRF, Materials Research Center, Indian Institute of Science (Bangalore, India) 12.2015 – 05.2016

- Research 1: Salicylic acid –PCL based biodegradable polymeric implant for cancer therapy and anti-cancer applications
- Research 2: “Development of particulate reinforced boron carbide-based composites for high temperature application” in collaboration with Bhabha Atomic Research Center, India
- Research 3: BrahMos Project; Ultra high temperature ceramics for hypersonic vehicle applications

M. Tech project and internship, Georgia Institute of Technology (Atlanta, Georgia, U.S.A.)

- Research 1: Package integrated high density thin capacitors and inductors 01.2015 – 03.2015
- Research 2: Nanomagnetic composites for antenna application 06.2013 – 07.2013

B. Tech and other research projects, Indian Institute of Technology (BHU), Varanasi (India)

- Research 1: Synthesis of bioactive glass Nano-powers by sol gel process 02.2014 – 09.2014
- Research 2: Study on Bioactive Glasses 08.2012 – 12.2012
- Research 3: Commercialization of Solid Oxide Fuel Cells (SOFC's) 12.2011 – 04.2012

TECHNICAL SKILL SET

RESEARCH-RELATED CHARACTERIZATION SKILLS: Synthesis/casting techniques, microstructure and phase characterizations (SEM, XRD etc.), leaching and solution analysis (ICP-OES, ICP-MS), mechanical properties (compressive, tensile, hardness etc.) measurements, BET pore-related characterizations (pore volume, size, structure), particle size distribution, zeta potential, surface area, bacteria culture, thermal characterization (DTA/TGA), viscosity measurement, chemical durability etc.

COMPUTER SKILLS: Microsoft office, Origin, ImageJ, Design expert

TEACHING AND MENTORING

- Mentoring a master's student for the NSERC Alliance Project Jan 2023-current
- Postdoctoral teaching fellow for the undergraduate Ceramics lab Jan-April 2023
- Teaching assistant in the MTRL 382: Ceramics lab with 300+ students, UBC 2017-2022
- Mentored 21 senior-level undergraduate students for Capstone design project, UBC 2020-2021
- Trained and mentored 3 summer students, UBC 2018-2020
- Guest lectured on “Geopolymers” as an invited speaker for the CIVL 529 course, UBC 2021-2022

MANAGEMENT AND LEADERSHIP

- Lab manager of UBCeram group (Ceramics lab) group, UBC 2018-2022
- Member of multidisciplinary research groups UBCeram (Materials) and SIERA (Civil) 2018-2022
- Member of the local safety team (LST), Materials Engineering, UBC 2018-2022
- Vice-president of the Joint student chapter, Materials Engineering, UBC 2017-2018
- Member of Graduate Student Society (GSS), UBC 2017-2018
- Volunteer, Environmental team at VMFF, Hindi samiti and Open day at IISc 2015-2018

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SELECTED ACADEMIC ACHIEVEMENTS

- Recipient of **Science and Engineering Research Board overseas doctoral fellowship**, UBC, 2016-2021
- Recipient of **J Keith Brimacombe Memorial Scholarship** awarded for the most exceptional graduate research work in the **Materials Engineering Department**, UBC, 2020
- Recipient of **John S. Nadeau memorial scholarship** awarded for research excellence with exceptional service to graduate student community in the Materials Engineering Department, UBC, 2018
- Won **3rd prize** at the student award competition, **American Concrete Institute (ACI)**, British Columbia Chapter (2020) and **METSOC** (2017)
- Rated in the **top 10% student bracket** for the research work at **Indian Institute of Science, Bangalore**, 2016
- Recruited by **Board of Research in Nuclear Science (BRNS)**, India as **Junior research fellow** for nuclear reactor related project, 2016
- Assisted **BrahMos Aerospace Private Limited** (India Russia Joint Venture) mentors for the collaborated project work at **IISc**, 2015-16
- Received an overall intern rating of **A+** for the **M.Tech project** at **Georgia Institute of Technology, US** for **outstanding** performance, 2015
- Secured **excellent 'S' grade (Perfect 10)** in the **M.Tech and B.Tech projects**, **IIT (BHU)**, 2014-2015
- Received **Ministry of Human Resource Development Scholarships** (India) for securing **AIR 290** in Graduate Aptitude Test Examination (**GATE**), 2014
- Ranked amongst top 1.2% in **IIT-JEE** and top 1.3% in **All India Engineering Entrance Examination** among over 500,000 students, 2010

PUBLICATIONS AND POSTERS

- Peer review article "**Conditioning of simulated cesium radionuclides in NaOH-activated fly ash-based geopolymers**" published in **Journal of Cleaner Production**, as a **first and corresponding author**, [DOI: 10.1016/j.jclepro.2022.134984](https://doi.org/10.1016/j.jclepro.2022.134984), 2022
- Published peer review article "**Leaching of immobilized cesium from NaOH-activated fly ash-based geopolymers**" in **Journal of cement and concrete composites**, as a **first and corresponding author**, <https://doi.org/10.1016/j.cemconcomp.2022.104679>, 2022
- Co-author of book chapter named "**Leaching of concrete with mine tailings**" in book: **Advances in the toxicity of construction and building materials**, pp.537-588 at the **University of British Columbia, Vancouver, BC, Canada (ISBN: 978-0-12-824533-0)**, 2022
- Presented the research work "**Processing and characterization of fly ash geopolymers for encapsulation of nuclear waste containing cesium**" as an invited speaker in **14th Pacific Rim Conference on Ceramic and Glass Technology**, 2021
- Presented the research work "**Fly ash geopolymers for Cesium containing waste immobilization**" in **Materials Engineering Research Conference (MERC)**, 2019
- Won **3rd prize** as a co-author for the poster "**Process development for fast setting geopolymers**" at the **56th Annual COM conference, METSOC**, 2017
- "**Modulated in Vitro Biocompatibility of a Unique Cross-Linked Salicylic Acid-Poly (ϵ -caprolactone)-Based Biodegradable Polymer**" research article is published in peer reviewed **ACS applied materials and interfaces international journal (DOI: 10.1021/acsami.6b10711)**, 2016

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- **“Ultra-thin substrate-integrated self-healing nanocapacitors with low-leakage currents and high-operating frequencies”** is published in peer reviewed **IEEE, Transactions on Components, Packaging, and Manufacturing Tech.** international journal (**DOI: 10.1109/TCPMT.2016.2602213**), 2016
- **Co-author** of book chapter named **“Embedded Passives”** in book: Materials for Advanced Packaging, pp.537-588 at School of Electrical and Computer Engineering, **Georgia Institute of Technology, Atlanta, GA 30332, USA** (**DOI: 10.1007/978-3-319-45098-8_13**), 2016
- Presented the poster **“Potential of Aluminosilicate Geo-Polymer cements towards green building and sustainable urban development”** as the first author in **Pacific Centre for Advanced Materials and Microstructures (PCAMM)** conference, Vancouver, 2016
- Co-authored for the poster **“Setting rate limiting step in alumino-silicate geopolymers”** in **PCAMM conference**, Vancouver, 2016
- **“Influence of barium substitution on bioactivity, thermal and physico-mechanical properties of bioactive glass”** is published online in peer reviewed **MSE C international journal** (<http://www.sciencedirect.com/science/article/pii/S0928493115000594>), 2015
- **“Magnetic and Dielectric Property Studies in Fe- and NiFe-Based Polymer Nanocomposites”** is accepted in peer reviewed **Journal of Electronic Materials** and published online (<http://link.springer.com/article/10.1007%2Fs11664-015-3801-x>), 2015
- **Won 1st prize** at 77th Annual Conference of Indian Ceramic Society for paper presentation, (2013) – Studies on in vitro Bioactivity of SIC / Bioactive Glass Composite

RELEVANT COURSE WORK

Hydrometallurgy I, Condition Assessment and Rehabilitation of Civil Infrastructure, Fundamental of Ceramic Processing, Nanotechnology, Materials Science, Glass Technology and Bio ceramics, Electro Ceramics, Industrial Economics and Factory management, Advanced Techniques for material characterization and Refractories

VOLUNTEERING AND EXTRACURRICULAR ACTIVITIES

- Facilitated in establishing capstone design project (MTRL-467) for the senior-level undergraduate course, UBC, 2020
- Organized departmental academic events including, industry night, technical talks, donut and coffee gathering etc. at UBC, 2018-19
- Managed and organized departmental social events including welcome back party, soccer match, hikes etc. at UBC, 2018-19
- Performed as a singer and guitarist in various cultural events conducted by Indian Graduate Student Association (UBC) and Indo Canadian-Caribbean cultural society of BC, 2017-2019
- Volunteered as an Environmental team member at the Vancouver music folk festival, 2017-18
- Volunteered for the Hindi samiti organization at Indian Institute of Science, Bangalore, 2016
- Performed as a solo artist in various musical events at IISc, Bangalore, 2016
- Volunteered for an ‘Open day’ event on the earth day at IISc, aimed to enlighten professors, college/school students about the current research work carried out in the labs, 2016
- Organized and volunteered for an open marathon event named ‘Sadbhavna Daud’ at IISc, Bangalore, 2016
- Participated as a singer and guitarist in various musical events such as ‘Jhankaar’ and ‘Bandish’ at IIT(BHU), Varanasi, 2010-2015