C 3A, Vijay Nagar
Delhi, India

School of Graduate Studies
University of Toronto
702/704 Spadina Avenue Toronto
ON Canada M5S 2J2

Dear Graduate Selection Committee:

I am writing this letter to express my sincere interest in the University of Toronto's PhD(Direct Entry)-Physics program in the Earth, Planetary and Atmospheric Physics(EAPP) group at the Department of Physics in University of Toronto. I have been working as a Scientist at the Indian Institute of Tropical Meteorology , Pune, India since last three years doing research in the field of Earth Sciences.

I have been wanting to pursue a PhD since my undergraduate days and the EAPP group at the University of Toronto has everything that I am looking for in a doctorate program. The research components that have appealed me to apply to the program are the lecture series organized by the group as well as the opportunities provided to present and interact with other researchers in the field. Furthermore the group is focussed on basic science with applications to assessments of climate change, environmental impacts of air pollution and the forecasting problems which have been a part of my work in the last three years. The EAPP group will provide me with an excellent exposure in these subject areas and which I hope will lead me to successfully completing my Doctorate training in Earth Sciences.

In addition, I believe that the postgraduate study at the group will help me achieve my short term and long term goals. I want to enhance my skills and gain experience and exposure in Earth Sciences. For this reason I believe that the program will be an ideal one. My short term goals are to learn the best practices that could help solve the mysteries of our planet using computation and observations. After completion of my doctoral training, I plan to seek a position wherein I could do my research as well as do teaching.

I am a hard working, self motivated individual and am prepared to take on the challenges that a PhD has to offer. I was inclined towards research since my Bachelors and had a research paper in my third year at college. And as I got an opportunity to work in research immediately after that(got selected as one of 25 out of 7000 candidates after screening from a competitive entrance test all over India), I want to do a direct PhD and this program is, I believe the apt one for me.

I desire to contribute to the planet Earth in the best way possible and search for ideas so that it could be habitable for our future generations. I am confident that the PhD degree will help me pave the way for my aspirations. Thank You for considering my candidacy for the PhD(Direct Entry) program at the University of Toronto. My curriculum vitae and a brief statement of research experience are enclosed for your review. Please let me know of any additional details I can provide.

Sincerely,

Manmeet Singh
PhD(Direct Entry)-Physics candidate
University of Toronto

ManmeetSingh

Researcher, AI Enthusiast

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Web & Git

about.me/manmeet
bitbucket.org/singh2299
github.com/manmeet3591

Programming

Languages:
Fortran, Python, C, C++

Parallel Processing:
MPI, OpenMP, FMS

Other Softwares:
MATLAB, NCL, cdo

Visualization:
Ferret, MATLAB, Paraview(basic)

OS Preference

GNU/Linux ★★★★★
Windows ★★★☆☆

Experience

09/15 - Now **Scientist B** Centre for Climate Change Research, IITM Pune, India
Development of Aerosol module for IITMESM, Preparing CMOR implementations for CMIP6 participation, Introduction of collision physics in Spectral DNS.

06/15 - 08/15 **Project Scientist B** Centre for Climate Change Research, IITM Pune, India
Studies on Phase Coherence of ENSO and ISMR, Development of Parallel module for Finite Difference DNS

08/13 - 05/15 **Trainee Scientist** Centre for Advanced Training, IITM Pune, India
Coursework in Earth System Science and Climate, Project : Developement of Inhouse DNS(Finite Difference) code at IITM

Education

2013 - 2015 **Certificate of Completion, Course on Earth System Science and Climate**
Centre for Advanced Training, IITM Pune, India
Main subjects: General Circulation and Climate, Geophysical Fluid Dynamics, Oceanography, Boundary Layer Meteorology, Computer Programming
Title of the Thesis: "Development of a Direct Nuemrical Simulation Code: Simulating Incompressible Laminar Flows".
A two dimensional laminar solver for Navier Stokes equations developed from scratch and validated

2009 - 2013 **Bachelor's Degree in Civil Engineering** Thapar University, Patiala, India
Main subjects: Mathematics and Physics, Programming, Fluid Mechanics, Solid Mechanics, Hydrology, Numerical Methods, Design of Concrete and Steel Structures
Title of the Thesis: "Design of Yale-National University of Singapore Campus, EWS for Conscient Gurgaon and Dusit Devrana Resort".
Thesis activity carried out during six month internship period at Eigen Technical Services(Meinhardt Ltd).

2009 **Senior Secondary** Rosary Senior Secondary School, Delhi, India
Main subjects: Mathematics, Physics, Chemistry, Computer Science.

Certifications

01/2016 **Machine Learning** Stanford University on Coursera
Developing a 2 layer Neural Network

Places Lived

Languages

English ★★★★★
French ★☆☆☆☆
Punjabi ★★★★★
Hindi ★★★★☆
Sanskrit ★★☆☆☆

Poster Presentations and Lectures Delivered

1. Delivered a Special Talk on "Introduction to MPI" and conducted a hands on session at the Advanced School on Earth System Modelling at Indian Institute of Tropical Meteorology, Pune, India (July 2016)

2.) Contributed and Presented towards the Poster titled "Response of IITM-ESM-v2 to naturally occurring tropospheric aerosols" at the Annual Research Advisory Committee(RAC) meeting during 12-13 January 2016 authored by A. Choudhury, M. Singh, N. Sandeep, A. G. Prajeesh, P. Swapna, R.Vellore, and R. Krishnan.

Publications

Manmeet Singh, Tanuj Chopra
Use of Computer Applications for Determining the Best Possible Runway Orientation using Wind Rose Diagrams
Proceedings of the 2nd International Conference on Recent Trends in Transportation, Environmental and Civil Engineering (TECE 2012), Dubai, UAE, Sep 20-21, 2012

Other Info

Conferences and Training Workshops:

1. Advanced School on Earth System Modelling & Workshop on Climate Change and Regional Impacts over South Asia at Indian Institute of Tropical Meteorology, Pune, India during July 18-29 2016

2. ICTP-IITM-COLA Targeted Training Activity (TTA): Towards improved monsoon simulations at The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy during June 13-17 2016

3. The 2nd Pan-Asia ESGF Training Workshop for CORDEX at Korea Meteorological Administration, Jeju, South Korea during Feb 23-25 2016

4. Advanced Refresher Course on Operational Climate Services at Meteorological Training Institute, Pune, India during Aug 24-28 2015

5. HPC Training at Indian Institute of Tropical Meteorology, Pune, India organized by IBM India during Aug 24-28 2015

October 14th, 2016

Manmeet Singh

Manmeet Singh
send2manmeet@gmail.com
https://github.com/manmeet3591

Statement of Research Experience

My research experience has primarily been in the use of Numerical Simulations such as Earth System Modelling, Direct Numerical Simulations and use of observational datasets to understand and improve the parameterizations in the models. Specifically I have been working in the following areas:

- The development and understanding of response to aerosol forcing in IITM Earth System Model. Along with one of my colleague, we developed a module for implementing aerosols in the model. Also I wrote a module to develop the CMOR implementations in the model. These requirements are required for participation of the model in CMIP6.

- I have been working on developing a Finite Difference Direct Numerical Simulation(DNS) code from scratch which is at a 2D laminar parallel stage and would be used to study the entrainment and mixing that happen in clouds.

- In addition to my own DNS, I have been working to develop the collision coalescence module for a Spectral Langragian DNS code. This work is complete but needs to be validated further.

- I developed a Non Linear Time Series Analysis code following Kurths to study the phase coherence between various signals such as ENSO and Indian Summer Monsoon Rainfall. This code is available on my github page.

- I have also as a part of developing a Neural Network Code in Fortran worked on TRMM data. This work is in a preliminary stage, the code being available on github.