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EDUCATION

Honours BSc, Specialist, Physical and Mathematical Sciences
University of Toronto Scarborough, Toronto, ON
Class of 2019
GPA: 3.77

TECHNICAL SKILLS

Proficient in programming Modern Fortran, C and C++ for parallel computing on CPU and GPU. Experience working with OpenMP, MPI, OpenCL and CUDA for parallel computing on a single workstation or cluster. Proficient with Python and working knowledge of R, Matlab and Mathematica. Some experience with hardware design with FPGAs and assembly programming. Experience building and maintaining HPC cluster.

AWARDS

- Canadian Institute for Theoretical Astrophysics Undergrad Research Award, Summer 2018
- UTSC DPES Student Excellence and Leadership Award, Academic Year 2017/2018
- UTSC Academic Travel Fund, November 2017
- Center for Planetary Sciences Undergraduate Research Fellowship, Summer 2017

CONFERENCE TALKS

ASSU Undergraduate Research Conference
U of T, January 19, 2018

High Performance Computing In Astrophysics
General talk at an outreach type conference for all arts and science students discussing what we can accomplish using high performance computing in astrophysics. Examples from my work as well as highlights from recent high profile papers.

Numerical Methods for Planet Disk Interactions (NUMPDI)
UNAM, Cuernavaca, MX, November 20-24, 2017

Type 3 Planet Migration Studied with Large Scale NBody Simulations

Results and analysis of Type III planet migration based on simulations performed with a highly parallel NBody code I developed. I show the main features of this type of migration and how it differs from a fast Type I migration.

Toronto Meeting on Numerical Integration Methods in Planetary Science
UTSC, August 16-19, 2017

Numerical Simulations of Planet Migrations on CPU, MIC and GPU

Discussed methods for parallelizing a large NBody code and compared platforms of CPU, MIC and GPU. Discussed preliminary results from my work on Type III planet migration.

RESEARCH EXPERIENCE

Undergraduate Thesis   January-May 2019
Supervisor: Dr. Hanno Rein
Title: Analysis of 2-Body Resonances in Compact Planetary Systems

We are interested in studying the long term effects of resonances between two large planets that orbit near to the central star. We will apply this work to studying a to be determined Kepler system that has such a resonance.

CITA Undergraduate Research Fellow   Summer 2018
Supervisor: Dr. Almog Yalinewich
Title: Scaling Laws for High Velocity Asteroid Cratering

Numerical study to determine the scaling relations between energy, radius and time for high speed asteroid impacts using computational fluid dynamics. We applied this work to gnerating asteroid distributions in the early solar system from moon crater data.

Center for Planetary Science Undergraduate Research Fellow Summer 2017
Supervisor: Dr. Pawel Artymowicz
Title: Numerical study of Type III Planet Migration in Particle Disks

We performed high performance numerical simulations using my NBody code to study study planet migration driven my angular momentum transfer in the disk. Compared the results to those from several 2D and 3Dcomputational fluid dynamics codes.

TEACHING EXPERIENCE

Teaching Assistant: ASTA01: Introduction to the Astronomy of Planets and the Solar System   Fall 2018

Facilitated two 1 hour tutorials each week helping students work through problems related to the course. Marked assignments and kept detailed records of student performances.

Teaching Assistant: PHYA10, Introduction to Physics   Fall 2018

Facilitated a 3 hour practical session each week for approximately 20 students including working through problems in small groups, working on lab activities and demonstrating key problem solving methods. Managed detailed record of students performance and attendance.

Teaching Assistant: CSCA08 Introduction to Computer Science   Fall 2018

Inverted lecture style course where I helped students work on problems and demonstrated important solutions and problem solving methods during the lecture.

Teaching Assistant: CSCA20 Introduction to Programming   Fall 2017

Facilitated 2 hour tutorial sessions each week for introductory programming course. Provided sample problems for students to work on and demonstrated key programming and problem solving techniques.

Introduction to Scientific Programming Seminars   Fall 2017, Winter 2018

Optional informal seminar to teach introductory programming methods to students in first year physics. Designed content and delivered mini lectures introducing general programming in Python, including using Numpy, Scipy. Created sample problems for students to apply their skills to develop small, physics related programs.

PUBLIC

OUTREACH

U of T Planetarium Show Speaker Summer 2018

Presented three approximately 15 minute long planetarium shows for the general public at the U of T planetarium. Designed the show to be an interactive journey starting at right here in Toronto and taking people all the way to the farthest reaches of the CMB. Focused on pointing out qualitatively interesting objects in the solar system, galaxy and beyond while briefly relating them to the research performed in the department.

UTSC Telescope Tour Guide Summer 2017

Discussed interesting objects in we could see in the sky as well as other fun astronomy facts with the gneral public while they waited to take a turn looking out of the teloscope. Helped people operate the small telescopes and look at objects such as the moon, Jupiter and Saturn.