

# Lalit Jain

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## Summary

- Extremely strong mathematics background, strong problem solver and critical thinker.
- Extensive experience in academic and applied research environments.
- Proficient programmer, experience includes C++, Java, Maple, and Matlab.
- Effective leadership and organizational skills, demonstrated through conference organization and club leadership.

## Education

### Candidate for Masters of Mathematics in Pure Mathematics

University of Waterloo, Waterloo ON

1/2007 to 4/2008

Current GPA: 92.50/100

Thesis: *Koblitz's Conjecture for Elliptic Curves*

### Bachelors of Honors Mathematics in Pure Mathematics with a Minor in Combinatorics and Optimization.

University of Waterloo, Waterloo ON

9/2003 to 12/2006

Subject GPA: 92.54, Overall GPA: 91.18

Graduated with Honors and Distinction

## Work Experience

### Research Intern

Oak Ridge National Laboratories, Oak Ridge, TN

1/2008 to 4/2008

Currently researching instabilities in the Spallation Neutron Source particle accelerator.

Understanding these instabilities is crucial to achieve record breaking energies and pulse sizes necessary to establish project goals.

- Studied experimental beam data using Matlab for signal processing and visualization.
- Developing mathematical models to verify simulated predictions with experimental data. This is necessary to engineer feedback mechanisms to remove the instability.

### Instructor

University of Waterloo, Faculty of Mathematics

9/2007 to 12/2007

Taught MATH 135, Classical Algebra, a required course for all mathematics majors.

- Lectured for three hours a week.
- Worked with other instructors to develop effective classroom materials including lecture notes, assignments and exams.
- Extensively worked with students on a one to one basis providing extra help and enrichment.

### **Research Intern**

**University of Waterloo, Dept. of Pure Mathematics**

**5/2006 to 8/2006**

Number theoretic research involved extending Li and Pomerance's results on the Artin Conjecture for composite moduli in the integers to polynomial rings.

- Worked with a team of three students.
- Important research in a relatively unexplored area of mathematics.
- Individually developed unique mathematical sieving tools to count prime polynomials crucial to establishing the result.
- Co-authored a paper being prepared for submission.

### **Research Intern**

**University of Tennessee, Knoxville, TN**

**5/2004 to 8/2004**

Research involved showing Beuker's irrationality estimates of the transcendental number  $\zeta(2)$  were identical to those of Apéry's.

- Provided an elementary two page proof of a result previously considered very complicated.
- Effectively used Maple and Mathematica to implement hypergeometric summation.
- Co-authored a paper published in the *Journal of Integer Sequences*

### **Research Intern**

**University of Tennessee, Knoxville, TN**

**5/2004 to 8/2004**

Created mathematical models for general optimal control situations. Potential applications include determining timelines for projects which have intermittent funding.

- Developed the models involved using differential equation and optimal control theory.
- Wrote and documented a package in Matlab for optimal control computations.

## **Achievements**

### **Mike Van Goch Memorial Award, Fall 2007**

This annual award is presented to an outstanding fourth year student in Pure Mathematics at the University of Waterloo.

### **First Place Team, Waterloo Operations Research Contest, Summer 2006**

The contest involved designing and implementing an efficient model for the Cutting Stock Problem in a real life scenario. Our model and simulation outperformed every other entry and was the only entry to correctly provide a complete solution. Our model was developed using C++ and AMPL.

### **W.T. Tutte, Descartes National Scholarship**

Academic scholarship received throughout the duration of Bachelor's studies at the University of Waterloo.

### **Faculty of Mathematics, Dean's Honours List**

Appeared on the list in Fall 2003 and from Fall 2004 to Winter 2006.

## **Extracurriculars**

### **Waterloo Symposium in Undergraduate Mathematics**

- Envisioned this two day conference as a student contribution to the University Of Waterloo's fiftieth anniversary in the summer of 2007.
- Led an organizational team of 15 volunteers in all aspects of conference planning from obtaining sponsorship to inviting speakers.
- The conference attracted 110 students from around Canada.

### **Pure Math Club, University of Waterloo**

- President in Fall 2006.
- Organized the Integration Bee in Winter 2007. This multi round competition attracted 120 competitors who were challenged by 'non-standard' integration questions.

### **Current Programming Projects**

- Physick: A 2D physics simulator in Java.
- Musings: A web application focused on construction of mind webs. I am using a variety of web technologies.

### **Playing Guitar, Keyboard and Harmonica.**