

# Kenneth R. Roffo Jr.

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## Education

B.S., Physics, Mathematics, Computer Science anticipated 2017  
**SUNY Oswego - GPA 3.68**

New York State Advanced Regents Diploma with Honors 2012  
**John C. Birdlebough High School - GPA 91/100**

## Internships

See [this](#) interview about my internships and tutoring SUNY Oswego.

### **Software Engineer - NASA Jet Propulsion Laboratory**

The Deep Space Network consists of multiple antennae on Earth which communicate with space craft beyond the moon. In order to improve this process, NASA software engineers are developing a new software to generate files read by the antennae, however they must check that the new software does not generate files with errors. My project at JPL was to develop a diff tool using node.js which would compare these files, and display differences, which the users could flag as unimportant differences, or more importantly find defects in the products of their software.

Mentor: **Mark Johnston** Summer 2015

## Research Experience

### **An Asteroseismic Analysis of the Red Giant Branch Bump**

As an intern the Max-Planck Institute for Solar System Research in Göttingen, Germany I studied how asteroseismic parameters were effected during the RGB bump. I used the MESA stellar evolution code to generate tracks of models of stars with varying masses, then used ADIPLS to calculate the frequencies they would output as the stars passed through the bump.

Advisors: **Saskia Hekker, Earl Bellinger, George Angelou** Summer 2016

### **[The Application of Abstract Algebra to Twisty Puzzles](#)**

Rubik's Cubes have fascinated mathematicians ever since they made their debut in the

1970s. Since then, many differently shaped and sized variants of the Rubik's Cube (called twisty puzzles) have become available. In this research I applied concepts I learned in Abstract Algebra to describe these fascinating puzzles. I also worked on a design for a [puzzle which I have created](#), and 3D-printed thanks to SUNY Oswego's SCAC grant.

Advisors: **Bonita Graham, David Vampola**

Fall 2014 - Present

### **Fourier Decomposition Analysis of CSTAR RR Lyrae Variable Stars**

I began this research through a 6 week visit to India in summer 2014. My original, and now completed, goal was to determine the metallicities of several RR Lyrae variable stars.

Advisor: **Shashi Kanbur**

Summer 2014 - Present

## **Teaching**

### **Math Club Tutoring**

2015-Present

Organized and participated in free Math Club tutoring sessions for Calculus students.

### **Math and Sciences Tutor at SUNY Oswego**

2014-Present

Courses Tutored: Calculus 1, 2 and 3, Discrete Math, Physics 1 and 2, CS intro level

### **HON 150 Seminar Leader at SUNY Oswego**

Fall 2014

Prepared and presented weekly lectures for an introduction-to-college course. Created and Graded weekly writing assignments.

## **Talks**

*A New Cube.*

MAA Seaway Section Meeting, SUNY Geneseeo

2016

*The Invention of a Cube.*

Quest, SUNY Oswego

2016

*A Necessary Set of Turns to Solve a Rubik's Cube.*

MAA Seaway Section Meeting, Colgate University

2015

*The Necessity and Sufficiency of 5 Face Turns to Solve a Rubik's Cube.*

Quest, SUNY Oswego

2015

*RR Lyrae Metallicities from CSTAR data.*

Quest, SUNY Oswego

2015

*Fourier Analysis of CSTAR RR Lyrae Variable Stars.*

Rochester Symposium for Physics Students, SUNY Oswego

2015

*Metallicity determination for RR Lyraes observed from CSTAR telescopes in Antarctica.*

SUNY Undergraduate Research Conference, SUNY Brockport

2015

*The Line Trick to Multiplying Numbers and Polynomials.*

Math Club, SUNY Oswego

2015

## Honors

Honors Program - SUNY Oswego	2012-Present
<a href="#">Presidential Scholarship for Academic Achievement</a> - SUNY Oswego	2012-Present
Student Involvement Award - SUNY Oswego	Spring 2015
Sigma Xi and Office for Research and Sponsored Programs Award for Excellence in Research Presentation - SUNY Oswego	Spring 2015
<a href="#">Dean's List</a> - SUNY Oswego	Fall 2014 - Spring 2015
<a href="#">President's List</a> - SUNY Oswego	Fall 2012 - Fall 2013, Spring 2016
<a href="#">Youth of the Year</a> - John C. Birdlebough High School	2012
Presidential Community Service Award - Corporation for National and Community Service	2012
<a href="#">Senior Key in Mathematics</a> - John C. Birdlebough High School	2012
<a href="#">Eagle Scout</a> - Boy Scouts of America	2011

## Membership

SUNY Oswego Physics Club	2014-Present
SUNY Oswego Astronomy Club - <i>Treasurer</i>	2013-Present
SUNY Oswego Math Club - <i>President</i>	2012-Present
Omicron Delta Kappa National Leadership Honor Society	Inducted 2015
Phi Kappa Phi National Honor Society	Inducted 2014
National Honor Society	Inducted 2010
Tri-M Music National Honor Society	Inducted 2010
John C. Birdlebough HS Student Council - <i>President</i>	2010-2012
Boy Scouts of America - <i>Quartermaster, Assistant Senior Patrol Leader</i>	1999-2012

## Skills

Mac and Linux Proficient  
Proficient in Bash, Python, Java, Fortran, L<sup>A</sup>T<sub>E</sub>X, C/C++, Javascript, and HTML/CSS  
[Rubik's Cube Speed Solver](#)

Last updated: October 26, 2016