

Nikolaus Zen Prusinski

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EDUCATION

University of Wisconsin - Milwaukee, Milwaukee, WI

Bachelor of Science, Physics - Astronomy Emphasis, 2016 - Date

Bachelor of Science, Mathematics, 2016 - Date

Full time University Student since Fall 2016 (age 15) pursuing Astrophysics, Mathematics, and Music. Dean's Honor List 5/6 semesters, averaging 17-21 credits per semester. Current GPA: 3.928. Expected Graduation in May 2020.

Saint Francis High School, Saint Francis, WI

Finished High School campus work in two years (age 13 - 15) 2014 to 2016. Diploma conferred June, 2018; Valedictorian - Egregia Cum Laude.

Emphasis in Science, Math, Robotics, and Music at the Honors/AP level. Gifted and Talented Program, Board Sponsored Youth Options. Started College at age 15 (2016) at University of Wisconsin - Milwaukee. First in class rank with 4.548 GPA.

Deer Creek Intermediate School, Saint Francis, WI

General Curriculum - IQ Tested, Added to Gifted and Talented Program - 2013

MENSA International Invitation subsequent to above - skipped 8th Grade.

University of Wisconsin - Milwaukee (Online - Ed to Go):

Completed Introduction to Programming course (Professor Richard Blum) in JustBasic Language, editing graphical interfaces (2013).

RESEARCH EXPERIENCE

Northwestern University

Center for Interdisciplinary Exploration and Research in Astrophysics (CIERA)

Nancy Aggarwal, Christopher Berry, Aaron Geller; Summer 2019 NSF REU

Research Project: Detecting Orphan Memory from Gravitational Waves

- Worked in the Northwestern LIGO group studying the Levitated Sensor Detector's (LSD's) gravitational wave detection capabilities.
- Extended previous order of magnitude work on the LSD by estimating signal-to-noise ratios (SNRs) for both the memory and oscillatory components of a high frequency gravitational wave signal.
- Investigated the possibility of future orphan memory detections in LIGO for contrived GW bursts.

University of Wisconsin - Milwaukee

Center for Gravitation, Cosmology, and Astrophysics (CGCA)

Prof. Dawn Erb, Summer 2017 - Date

- Used data from the Hubble and Keck telescopes to study the connection between star formation and galactic-scale outflows of gas.
- Reduced data using *Grizli*, a newly-developed python pipeline, and made maps of the H α emission line for galaxies of interest.
- Designed code to determine areas, star formation rates, and SFR surface densities for each of the galaxies.

University of Wisconsin - Milwaukee

Center for Gravitation, Cosmology, and Astrophysics

Prof. David Kaplan, 2016 - 2017

- Worked with group of undergraduate students through the Arecibo Remote Command Center at UWM (ARCC@UWM) to detect pulsars.
- Classified output of pulsar search pipeline, using Pulsar Exploration and Search Toolkit (PRESTO) plots, to determine if new pulsar had been found.
- Conducted remote observations from UWM with the Arecibo Observatory in Puerto Rico and Green Bank Telescope in West Virginia, collaborating with other institutions around the country.

University of Wisconsin - Milwaukee

Hand Rehabilitation Laboratory

Dr. Na Jin Seo, 2012 - 2014

Designed, built, and programmed “Towerbot” Digital Filament Stimulator integral to Stroke Patient nerve regeneration. Worked with Dr. Na Jin Seo’s team including Dr. Pilwon Hur, Dr. Greg Slota, and Kishor Lakshminarayanan over two years as special collaborator.

SYMPOSIA

Nikolaus Prusinski, Nancy Aggarwal, Christopher Berry. “*Detecting Orphan Memory from Gravitational Waves.*” Poster presented at Adler Planetarium to general public. August 23, 2019. Chicago, IL.

Nikolaus Prusinski, Nancy Aggarwal, Christopher Berry. “*Detecting Orphan Memory from Gravitational Waves.*” Poster presented at Northwestern to CIERA physics/astro faculty, grad students, and staff. August 22, 2019. Evanston, IL.

Nikolaus Prusinski, Dawn Erb, Crystal Martin. “*Galactic-Scale Star Formation-Driven Outflows at $1 < z < 1.5$ in the 3D-HST Survey.*” Poster presented at 11th annual UWM Undergraduate Research Symposium. April 5, 2019. Milwaukee, WI.

Nikolaus Prusinski, Dawn Erb, Crystal Martin. “*Galactic-Scale Star Formation-Driven Outflows at $1 < z < 1.5$ in the 3D-HST Survey.*” Poster presented at 10th annual UWM Undergraduate Research Symposium. April 27, 2018. Milwaukee, WI.

RESEARCH FELLOWSHIPS

Senior Excellence in Research Award (SERA)

Awarded for 2019-2020 Academic Year to continue research with Prof. Dawn Erb on star formation and galactic outflows.

Served as ambassador for undergraduate research at UWM.

Northwestern University - Center for Interdisciplinary Exploration and Research in Astrophysics (CIERA)

2019 Summer Researcher through NSF REU program (see research website).

Support for Undergraduate Research Fellows (SURF) Grants

Awards for: 2017-2018 Academic Year, Summer 2018, 2018-2019 Academic Year, Summer 2019

Poster Presentations at 2018, 2019 UWM Undergraduate Research Symposiums.

GRANTS and SCHOLARSHIPS

James M. Martin Memorial Scholarship - for having the highest overall score in Modern Physics class - 2019

Wisconsin Space Grant Consortium (WSGC) Undergraduate Scholarship - 2018, 2019
Academic Excellence Scholarship - for being high school valedictorian - 2018, 2019
Hoye Scholarship - 2018

William L Walters Memorial Scholarship - 2018

Trustone Financial Scholarship - 2018

Saint Francis Civic Association Scholarship - 2018

UWM Manfred Olson Planetarium Scholarship - 2017

Joseph (Starr) Diny Scholarship - 2017

HONORS and AWARDS

National Society of Collegiate Scholars Nomination - 2019

Chancellor Award - for academic excellence - 2018, 2019

William Lowell Putnam Mathematical Competition Participant - 2017, 2018

Member UWM Honors College - 2017 - 2019

Junior Honor Court, Saint Francis High School; June, 2017; Valedictorian.

High Honor Roll - First in Class 4.548 GPA - 2014 - 2018

National Academy of Future Scientists and Technologists Award of Excellence Nomination - 2016

Named AP Scholar based on scores in AP classes, namely, AP Computer Science A, AP U.S. History, and AP Spanish Language and Culture (2015, age 14).

C.U.P.S. Grant - Achieved by Dr. Na Jin Seo and Mr. Peter Graven (STEM Team). - 2012 - 2013

FIRST FTC Inspire Award - for Robotic Programming and Sensor Integration - 2015

USFIRST Certificate of Appreciation - for Inspiring Youth STEM - 2011 - 2013

TEACHING EXPERIENCE

University of Wisconsin - Milwaukee

Supplemental Instruction Leader through the Student Success Center at UWM.

Tutoring calc-based E&M - Fall 2019 - Date

Saint Francis High School

Tutor in RobotC, Java, C++, Python, Math, and Music; individually and in small groups.

Deer Creek Intermediate School

Lecturer - RobotC Programming Movement and Sensor Integration (FTC) - 2013 - 2014

Developed Syllabus and Course Materials (PPT and MPG/AVI multimedia)

Instructor - FIRST FLL Mindstorms 2 Programming 4th - 8th Grade Students - 2013

Developed Course(s) with 8th Grade Science Teacher (Mr. Peter Graven), presenting during school year and summer programs.

Demonstrator/Instructor - Zen42 Tetrix Sensor Robot - 2012 - 2015

Design, Build, Program, and Present robots at Public Shows/Displays; Public Library

Demonstrations; G. E. Campus, Waukesha, WI for Scouts and General Public; St.

Francis Middle and High Schools; and East Troy High School. Search "Zen42" on

YouTube for examples.

**WORK RELATED
EXPERIENCE**

UWM Manfred Olson Planetarium

Present live shows to general audiences on constellations (and associated mythology), current astronomy news, and specific astronomical topics (e.g. black holes, birth of the universe, etc.). As lead stargazer, improved UWM observatory to feature a 14" reflecting telescope on a permanent computerized mount with astrophotography capabilities using a CCD camera. I was central to this \$18,500 project, sourcing telescope equipment, putting together the mount, and coordinating with university faculty and staff both in and outside of physics. Now the planetarium holds weekly stargazing events (weather permitting) allowing visitors to see a variety of objects through the telescope.

Co-Applicant Provisional and Utility Patent - 1998 - 2015

U. S. Patent and Trademark Office

Design, Research, and Field Test Face Protection device for bicyclists. Co-developed and formed online global retail sales of same (<http://gbnpro.com/>) as result of work.

Computer Repair and Build Service - 2010 - 2015

PC, Mac, Windows, Linux, iOS and Android repairs and upgrades, hardware, software and new builds. Antivirus cleanups, small network repairs, wired and WiFi functional. Most software work done remotely using TeamViewer and Skype.

**PUBLICATIONS,
PAPERS, VIDEO,
and INTERNET**

University of Wisconsin - Milwaukee - 2015 - Date

Manfred Olson Planetarium - Stargazing Group Leader

Planetarium Website Cover Piece and Bio - November 8, 2016

CBS Channel 58 News Interview - 2017

Research Demonstration with CCD Camera Measuring Linearity, Read Noise, and Gain - July 10, 2017

Provisional Patent Application USPTO (above) Co-developed graphics, claims, and abstract work with Patent Attorney - 2008 - 2009

Website: <http://nzp.guru/> Create, design, produce, and publish text and video on to private/public servers, Facebook, and YouTube. Publish to share programming privately and for High School Programming Classes. Also used to share recreational interests with friends/public to keep HTML/CSS web functional. Used WebExpression Web 4, Ipswitch 12. Testing on Mac Pro iOS, Linux (Zorin Distro) and Windows 7 - 10 systems. - 2008 - 2015

LANGUAGES

English - Native Language with College (AP) Level Competence

Spanish - Read, Speak, and Write at College (AP) Level Competence

**COMPUTER
SKILLS**

Languages: Python, Java, C, C++, Swift, L^AT_EX.

Web Development: HTML, CSS.

Applications: Mathematica, DS9, Dreamweaver, Photoshop, PTC Creo, Autodesk Inventor, SolidWorks, MS/Apple Office Suites, Xcode, Finale.

Operating Systems: Linux/Unix, Mac OS, Windows, iOS, Android.

**MEMBERSHIPS,
INTERESTS, and
VOLUNTEERING**

American Astronomical Society (AAS) Undergraduate Member - 2019 - Date
Milwaukee Community/UWM Chancellor Recognition for Solar Eclipse - 2017
UWM Astronomy Club - 2015 - Date
UWM Planetarium Stargazing Lead - 2015 - Date
UWM Center for Gravitation, Cosmology, and Astrophysics (CGCA) - 2016 - Date
FAA Private Pilot - Single and Multi-Engine Fixed Wing Aircraft - 2010 - Date
Milwaukee County Park/Golf Courses - Junior Golfer 17 handicap - 2013 - Date
Great Lakes Sailor - Helm, Nav, and Sheet Masthead Sloop "Paprika" - 2010 - Date
Musician (Orchestra Student) - French Horn, Piano, and Trumpet - 2008 - Date
Horn Participant: UWM Horn Choir, UWM Symphony Band, UWM University
Community Orchestra, Milwaukee Municipal Orchestra - 2016 - Date
Lighthouse Activities Crew - St. Francis High School Snack Food Preparation and
Service - 2015 - 2016
St. Ann Center for Intergenerational Care - Summer Help - support for all ages. - 2012