

Neil R. Voss

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CURRENT POSITION

Associate Professor of Biology

Aug. 2016 – *present*

Roosevelt University

EDUCATION

Yale University

New Haven, CT

2000 – 2007

Graduate research with Professors Peter B. Moore and Thomas A. Steitz.

Ph.D. in Molecular Biophysics and Biochemistry, 2007.

Thesis: “*Geometric Studies of RNA and Ribosomes, and Ribosome Crystallization.*”

Iowa State University

Ames, IA

1996 – 2000

Undergraduate research with Professor Michael C. Tringides.

B.S. in Physics with Distinction and Honors, 2000.

B.S. in Mathematics with Distinction, 1999.

RESEARCH INTERESTS

My research focuses on the structures of large biological macromolecules – from the beautiful symmetry of viruses to the incredibly complex shape of ribosomes – and the computational tools used to create and analyze them. To this end, my research involves three separate branches: (1) Advancing techniques and computational tools used in 3D electron microscopy. (2) Developing novel computational methods, geometric tools, and inexpensive 3D printing to analyze existing structures. (3) Discovery-based science built upon student structural projects in both protein purification.

RESEARCH APPOINTMENTS

Northwestern University Collaboration

Jan. 2016 – *present*

Collaboration with Yuan He, Director of the NU Electron Microscopy Core Facility.

Collaboration with Alfonso Mondragon, Former Director of the NU Electron Microscopy Core Facility

Assist with technical and computation problems.

Michigan University and San Diego Super Computing Center
2023

May 2020 – Nov.

Collaboration with Michael Cianfrocco, Assistant Professor of Biological Chemistry

From the grant: NSF Collaborative Research: ABI Development: Building a Community Gateway for Cryo-Electron

Microscopy Structure Determination (July 2018-2022) award

Assist with user training, outreach, testing, and computation problems.

New York Structural Biology Center Consultant

Jan. 2016 – May 2019

Collaboration with Bridget Carragher and Clint Potter.

Assistant Professor of Biology at Roosevelt University
2016

Aug. 2010 – Aug.

Northwestern University Visiting Scholar

May 2014 – Dec 2015

Collaboration with Vinzenz Unger, Former Director of the NU Electron Microscopy Core Facility.

Implemented Legion automated data collection on JEOL electron microscopes and Gatan imaging devices.

Scripps Research Post-doctoral Associate
2010

Dec. 2006 – Aug.

Advisors, Bridget Carragher and Clint Potter.
Learned the fundamentals of high resolution imaging in electron microscopy.
Developed new technologies for solving structures of unknown particles using image tilt pairs.

Yale University Graduate Student
2006

Sept. 2000 – Nov.

Advisors, Prof. Peter Moore & Prof. Thomas Steitz.
Investigated higher eukaryotic ribosomal purification and crystallization.
Developed computational geometry software for analyzing the exit tunnel of the ribosome.

Ames Laboratory Research Assistant
2000

Mar. 1997 – Aug.

Advisor, Prof. Michael C. Tringides, Iowa State University.
Analyzed data from STM and SPA-LEED experiments to analyze diffusion properties of atoms.
Developed data processing techniques and high-throughput software implementing them.

Ames Laboratory Research Assistant
2000

May 2000 – Aug.

Advisors, Dr. Jaime Morris and Prof. Kai-Ming Ho, Iowa State University.
Developed software to align proteins for CASP4 protein structure prediction contest.

Rice University Keck Fellow
1999

May 1999 – Aug.

Advisor, Prof. George Fox, University of Houston.
Created a database of non-canonical base pair formations in RNA.

Ames Laboratory Research Assistant

Jan. 1997 – Mar. 1997

Advisor, Prof. Stefan Zollner, Iowa State University.
Analyzed data from elliptical reflections to assess optical properties and band structure of semi-conductors
Used programming to fit data to complex equations

TEACHING EXPERIENCE

Teaching load: 2010-2016: six courses per year; Spring 2017-Spring 2021: seven courses per year; nine contact hours per week.
17 different courses. † – denotes new course preparation for that semester.

Fall 2024

BIOL 480-01/480-20, Applications of Biotechnology (remote/hybrid)
BIOL 351/451-10, Genetics Lecture (remote)
† BIOL 318/418-10, Biostatistics Lecture (face-to-face)
BCHM 355/455-20, Biochemistry Lecture (CBA)

Summer 2024

BIOL 383/483-10/24 Special Topics: Biology and Ethics in Film (remote)

Spring 2024

BIOL 301-20A, Cellular and Molecular Biology Lecture (remote)
BCHM 355/455-20, Biochemistry Lecture (remote)
BCHM 356/456-20, Biochemistry Lab (face-to-face)
BIOL 301-20B, Cellular and Molecular Biology Lab (face-to-face)
BIOL 351/451-24, Genetics Lecture (CBA)

Fall 2023

BIOL 480-01/480-20, Applications of Biotechnology (remote)
BCHM 355/455-20, Biochemistry Lecture (remote)

BIOL 351/451-24, Genetics Lecture (remote)

Spring 2023

BIOL 301-20A, Cellular and Molecular Biology Lecture (remote)

BCHM 355/455-20, Biochemistry Lecture (remote)

BCHM 356/456-20, Biochemistry Lab (face-to-face)

BIOL 301-20B, Cellular and Molecular Biology Lab (face-to-face, CBA)

BIOL 351/451-24, Genetics Lecture (CBA)

Fall 2022

BIOL 480-01/480-20, Applications of Biotechnology (remote)

BCHM 355/455-20, Biochemistry Lecture (remote)

BIOL 351/451-24, Genetics Lecture (remote)

Spring 2022

BIOL 301-20A, Cellular and Molecular Biology Lecture (hybrid remote)

BIOL 301-20B, Cellular and Molecular Biology Lab (hybrid face-to-face/remote)

† BIOL 383/483-10/24 Special Topics: Biology and Ethics in Film (remote)

Fall 2021

BIOL 480-01/480-20, Applications of Biotechnology (remote)

BCHM 355/455-20, Biochemistry Lecture (face-to-face)

BIOL 351/451-10/24, Genetics Lecture (remote)

† BIOL 453-10, Molecular Biology Lecture (remote)

Spring 2021

BIOL 301-20A, Cellular and Molecular Biology Lecture (remote)

BIOL 301-20B, Cellular and Molecular Biology Lab (hybrid face-to-face/remote)

BCHM 357/457-20, Advanced Biochemistry Lecture (remote)

Fall 2020 – Full Remote

BIOL 480-01/480-20, Applications of Biotechnology (remote)

BCHM 355/455-20, Biochemistry Lecture (remote)

BIOL 351/451-24, Genetics Lecture (remote)

Spring 2020 – COVID Adapted

BIOL 301-20A, Cellular and Molecular Biology Lecture (converted to remote)

BIOL 301-20B, Cellular and Molecular Biology Lab (converted to remote)

† BIOL 383/483-01 and 383/483-20, Special Topics: Medical Devices (video-conferenced/remote)

Fall 2019

BIOL 480-01/480-20, Applications of Biotechnology (video-conferenced)

BCHM 355/455-20, Biochemistry Lecture (face-to-face)

BIOL 351/451-10, Genetics Lecture (face-to-face)

BIOL 351/451-24, Genetics Lecture (face-to-face)

Spring 2019

BIOL 301-20A, Cellular and Molecular Biology Lecture (face-to-face)

BIOL 301-20B, Cellular and Molecular Biology Lab (face-to-face)

BCHM 357/457-01, Advanced Biochemistry Lecture (face-to-face)

BCHM 357/457-20, Advanced Biochemistry Lecture (face-to-face)

Fall 2018

BIOL 480-10/480-24, Applications of Biotechnology (video-conferenced)

BCHM 355/455-20, Biochemistry Lecture (face-to-face)

BIOL 351/451-01/20, Genetics Lecture (video-conferenced)

Spring 2018

BIOL 301-20A, Cellular and Molecular Biology Lecture (face-to-face)

BIOL 301-20B, Cellular and Molecular Biology Lab (face-to-face)

BCHM 355/455-20, Biochemistry Lecture (face-to-face)
BIOL 361/461-20, Information Technology for the Sciences (face-to-face)

Fall 2017

BIOL 480-10/480-24, Applications of Biotechnology (video-conferenced)
BCHM 357/457-10, Advanced Biochemistry Lecture (face-to-face)
BIOL 351/451-01/20, Genetics Lecture (video-conferenced)

Spring 2017

BIOL 301-20A, Cellular and Molecular Biology Lecture (face-to-face)
BIOL 301-20B, Cellular and Molecular Biology Lab (face-to-face)
BCHM 355/455-20, Biochemistry Lecture (face-to-face)
Course buy-out

Fall 2016

BIOL 480-10, Application of Biotechnology (video-conferenced)
† BIOL 361/461-24, Information Technology for the Sciences
† BIOL 351/451-20, Genetics Lecture

Spring 2016

BIOL 301-20B, Cellular and Molecular Biology Lab
BIOL 301-20A, Cellular and Molecular Biology Lecture
Course buy-out

Fall 2015

† BIOL 480-10, Application of Biotechnology (video-conferenced)
BIOL 364/464-24, Protein Structure Determination
† BIOL 202-20, Ecology, Evolution, and Genetics Lecture

Spring 2015

BCHM 357/457-10, Advanced Biochemistry Lecture
BCHM 393/493-10, Biochemistry Seminar
BIOL 301-20B, Cellular and Molecular Biology Lab
BIOL 301-20A, Cellular and Molecular Biology Lecture

Spring 2014

BCHM 357/457-10, Advanced Biochemistry Lecture
† BCHM 393/493-10, Biochemistry Seminar
BIOL 301-20B, Cellular and Molecular Biology Lab
BIOL 301-20A, Cellular and Molecular Biology Lecture

Fall 2013

BCHM 354/454-01, Biochemistry Lab
BCHM 355-01, Biochemistry Lecture
† BIOL 364/464-24, Protein Structure Determination

Spring 2013

BCHM 357/457-10, Advanced Biochemistry Lecture
BIOL 301-20, Cellular and Molecular Biology Lab
BIOL 301-20, Cellular and Molecular Biology Lecture

Fall 2012

BCHM 355-01, Biochemistry Lecture
† BIOL 468-20, Research Methods
† PHYS 202-20, Intro to Algebra-based Physics II Lecture
† PHYS 202-20, Intro to Algebra-based Physics II Lab

Spring 2012

BIOL 301-20, Cellular and Molecular Biology Lecture
BIOL 301-20, Cellular and Molecular Biology Lab

Fall 2011

† BCHM 354/454-01, Biochemistry Lab
† BCHM 355-01, Biochemistry Lecture
BIOL 111-01, Human Biology Lecture
BIOL 111-01, Human Biology Lab

Spring 2011

† BCHM 457-01, Advanced Biochemistry Lecture
† BIOL 301-10, Cellular and Molecular Biology Lecture
† BIOL 301-10, Cellular and Molecular Biology Lab

Fall 2010

† BIOL 111-01, Human Biology Lecture
† BIOL 111-01, Human Biology Lab

Teaching Assistantships Prior to Faculty Appointment

Spring 2004: X-ray Crystallography (MB&B 701B3) Graduate Recitation Teaching Assistant
Spring 2003: X-ray Crystallography (MB&B 701B3) Graduate Recitation Teaching Assistant
Spring 2002: X-ray Crystallography (MB&B 701B3) Graduate Recitation Teaching Assistant
Fall 2001: Biochemistry Lab (MB&B 251La) Graduate Lab Teaching Assistant
Summer 2000: Physics Recitation and Lab Teaching Assistant
Spring 2000: Physics Recitation and Lab Teaching Assistant
Fall 1999: Physics Recitation and Lab Teaching Assistant

FACULTY SERVICE

Advising Responsibilities

2011/2012 Academic year: 14 students
2012/2013 Academic year: 35 students
2013/2014 Academic year: 38 students
2014/2015 Academic year: 12 students (research leave)
2015/2016 Academic year: 40 students
2016/2017 Academic year: 20 students
2017/2018 Academic year: 15 students
2018/2019 Academic year: 11 students
2019/2020 Academic year: 20 students
2020/2021 Academic year: 35 students
2021/2022 Academic year: 27 students
2022/2023 Academic year: 27 students (so far)

Faculty Search Committees

Member, NTT Professor of Biochemistry Search Committee (2017), cancelled
Member, Assistant Professor of Ecology & Genetics Search Committee (2015–2016), successful hire
Member, Assistant Professor of Biochemistry Search Committee (2014–2015), successful hire
Chair, Assistant Professor of Physics Search Committee (2013–2014), successful hire
Chair, Visiting Professor of Physics Search Committee (2012–2013), successful hire

Master's Thesis Advisor

Bao Tran, “Investigation of Ribonuclease Degradation Activity During Purification of Artemia Brine Shrimp Ribosome” (2019)
Amar Kumar, “Isolation, Purification, and Microscopy of Artemia Ribosomes” (2016)

Master's Thesis Committees

Aloysius Nootens, “Analysis of Double Budding *S. cerevisiae* in Different Nutritional Media” (2016)
Sheba Prasad, “Inhibitive Effects of Antioxidant EGCG on Pancreatic Cancer” (2016)
Debbie Eng, “Detection and Comparison of Healthcare-Associated Bacterial Pathogens on Potential Dry Fomites in Hospital and Community Massage Therapy Settings” (2015)
Angela Piotrowski, “Observational Record of Double Budding in Wild Type *S. cerevisiae*” (2014)

Event Organizer

Science Career Day (Spring 2019)
Math and Science Research Symposium Coordinator (Spring 2012)
Schaumburg Student Meet and Greet (Fall 2012)

Committee and Event Service

Schaumburg Natural Science Club, lead faculty advisor, (Fall 2016 – Spring 2020)
Illinois Articulation Initiative (IAI) Major Biology, Representative, (Fall 2012 – *present*)
Math and Science Resource Center Committee, Member (Spring 2012 – *present*)
Junior & Senior Visit Day, Chicago (Fall 2015)
Math and Science Research Symposium Liquid Nitrogen Ice Cream Demonstration (Spring 2014, 2015, and 2017)
University Senator (Fall 2012 – Spring 2014)
Graduate Student Orientation (Jan 2012)
Open House Representative (Apr 2011, Nov 2011, Mar 2012, Apr 2012, Oct 2012, Apr 2013)

Manuscript Reviewer

1 completed assignment, Journal of Applied Crystallography (1 in 2021)
17 completed assignments, Journal of Structural Biology, Elsevier (3 in 2016, 4 in 2015, 3 in 2014, 2 in 2013, 4 in 2012, 1 in 2009, and 1 in 2008)
2 completed assignments, Transactions on Computational Biology and Bioinformatics, IEEE/ACM (1 in 2015, and 1 in 2014)

Fellowship and Grant Reviewer

2016 National Science Foundation (NSF) Graduate Research Fellowship Program (GRFP) panelist

Other service

Department Website Developer (Fall 2010 – present)
Fact Sheet (B.S., Biochemistry)

Professional Memberships

Biophysical Society (2011 – 2016), <http://www.biophysics.org/>
American Society for Biochemistry and Molecular Biology (2025) <https://www.asbmb.org/>

SOFTWARE DEVELOPMENT AND SUPPORT

GitHub account: <https://github.com/vosslab>

Primary/Sole Maintainer

- Biology Problems (2025)
Free and open problem sets for Biochemistry, Genetics
<https://biologyproblems.org/>
- libproteingeometry: Library for Protein Geometry
Tools for calculating Voronoi volume of atomic structures.
<http://geometry.molmovdb.org>
- 3v: Voss Volume Voxelator
Programs for the assessment of protein volumes using the rolling probe method.
<http://3vee.molmovdb.org> <https://github.com/vosslab/vossvolvox>
- TiltPicker
Tool for picking particles from image tilt pairs for random conical tilt (RCT).
<http://emg.nysbc.org/redmine/projects/software/wiki/TiltPicker>
- DoG picker
Particle picker that uses difference of Gaussians (DoG) for picking particles.
<http://emg.nysbc.org/redmine/projects/software/wiki/DoGpicker>

- FindEM v1.0
Original fast local correlation function (FLCF) template particle picker.
<http://emg.nysbc.org/redmine/projects/software/wiki/FindEM>
- CTF Eval
Contrast transfer function (CTF) Evaluation software for 3D Electron Microscopy.
<https://github.com/vossman/ctfeval>
- ACE2
A CTF Estimator (ACE) 2 with robust astigmatism estimation and CTF correction.
<http://emg.nysbc.org/redmine/projects/software/wiki/ACE2>

Team Maintainer

Appion

A pipeline for processing and analysis of EM images.

<https://appion.org>

Leginon

System designed for automated collection of images from a transmission electron microscope.

<https://legion.org>

Contributor

LibreOffice Suite, <https://www.libreoffice.org/>

Firefox Web Browser, <https://www.mozilla.org/en-US/firefox/>

RESEARCH SUPERVISION

Department consists of primarily undergraduates along with a master's program in both Biotechnology and Biology.

Master's Thesis Students

Greg Gillespie (Fall 2021 – Summer 2024)

Richard Helmuth (Spring 2019 – Spring 2021), did not finish

Bao Tran (Fall 2018 – Summer 2019)

Amar Kumar (Spring 2015 – Summer 2016)

Kayla Fouch (Spring 2014 – Spring 2017), did not finish

2025: 1 new students

- Manankumar Patel, master's

2023: 1 continued student, 2 new students

- Gregory Gillespie, master's
- Amber Misiowiec
- Armela Zeneli

2022: 1 continued student

- Gregory Gillespie, master's

2021: 1 new student

- Gregory Gillespie, master's

2020: 2 new students, 1 continued

- Richard Helmuth, master's
- Irena Mehic, undergrad
- Samantha McCarragher, undergrad

2019: 3 new students, 1 continued

- Bao Tran, master's
- Irena Mehic, undergrad
- Claudia Malekismail, undergrad
- Ankita Patel, master's

2018: 1 new student

- Bao Tran, master's

2016: 2 new students, 3 continued

- Kayla Fouch, master's
- Aisha Shajee, undergrad
- Amar Kumar, master's
- Ashley Anderson, master's
- Viral Patel, undergrad

2015: 6 new students, 2 continued

- Kayla Fouch, master's
- Dan Lim, undergrad NSF STEP
- Amar Kumar, master's
- Amarjeet Flora, master's
- Veda Patel, undergrad
- Aisha Shajee, undergrad
- Jeff Johnson, undergrad
- Parth Patel, undergrad

2014: 5 new students, 4 continued

- Kayla Fouch, master's
- Joel Bogolub, undergrad
- Ryan Dalton, undergrad NSF STEP
- Shail Patwari, undergrad
- Mohammed Tofa, master's
- Veda Patel, undergrad
- Sandy Mousheh, undergrad NSF STEP
- Angela Piotrowski, master's
- Lisa Sheth, master's

2013: 7 new students, 5 continued

- Kayla Fouch, master's
- Angela Piotrowski, master's
- Vikram Sharma, undergrad
- Fatima Ali, undergrad
- Qurat-ul-ain "Annie" Nasir, undergrad
- Nnenna Nwogu, master's
- Lisa Sheth, master's
- Shail Patwari, undergrad
- Orlando Lagunas, undergrad
- Sejalbin Patel, undergrad
- Mehvish Ali-Nasar, undergrad
- Maria Lazzara, master's

2012: 7 new students, 1 continued

- Syed "Hassan" Ali, undergrad
- William Wysocki, master's
- Nnenna Nwogu, master's
- Arjun Bose, high school
- Lisa Sheth, master's
- Sejalbin Patel, undergrad
- Qurat-ul-ain "Annie" Nasir, undergrad NSF STEP
- Mehvish Ali-Nasar, undergrad

2011: 5 new students

- Syed "Hassan" Ali, undergrad
- Samuel Shenker, undergrad NSF STEP
- Emma Turkson, BRIDGES/Elgin Comm. College
- Shazia Sarwar, undergrad
- Jennifer Campos, BRIDGES/Elgin Comm. College

HONORS

Phi Kappa Phi Honor Society Member (Top 5% of university)
 Golden Key Nat. Honor Society Member (Top 15% of university)
 Outstanding Senior in Mathematics (Top student in the department, 1998-1999)
 Pi Mu Epsilon Top PUTNAM Score Award Winner (1998 and 1997)
 Mathematical Contest in Modeling (Honorable Mention, 1999; Successful Part., 1998)
 Iowa Mathematics Competition (2nd place, 1998, 4th place 1999)
 American High School Mathematics Exam Honor Roll (1995)
 Outstanding First-Year Teaching Award (1999-2000)
 Collin's Scholarship Winner (1999, award in undergraduate research)
 General Award for Superior Academic Performance in Physics (1996-97 & 1997-98)

GRANTS AND FELLOWSHIPS

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1. Illinois State Library OER Grant "Dynamic and Sharing-Resistant OER Problem Sets for Biochemistry and Genetics" (June 2024–June 2026) \$98,097 (PI: Neil Voss)
 a. <https://www.carli.illinois.edu/products-services/collections-management/fy2024-sos/isl-oer-grant-recipients>
 2. Consortium of Academic and Research Libraries in Illinois (CARLI): Development of Ancillary Teaching Materials and Labs for Anatomy and Physiology (June 2023–2025) \$65,457.15

- a. <https://www.carli.illinois.edu/illinois-scoers-round-three-awardees>
3. Consortium of Academic and Research Libraries in Illinois (CARLI): Development and Implementation of Open-Access Problems and Activities for Health-Focused Chemistry Courses (May 2022-2024) award: \$59,961.60
 - a. <https://www.carli.illinois.edu/products-services/collections-management/IllinoisSCOERsRound1Awardees>
4. National Science Foundation: STEM Teaching Scholars for High Need Chicago-Area Schools (June 2017-2025) award: \$1,429,240
 - a. https://www.nsf.gov/awardsearch/showAward?AWD_ID=1660728
5. National Science Foundation: Collaborative Research: ABI Development: Building a Community Gateway for Cryo-Electron Microscopy Structure Determination (July 2018-2022) award: \$26,244
 - a. https://www.nsf.gov/awardsearch/showAward?AWD_ID=1759735
6. Max Goldenberg Foundation, “Sucrose Gradient Centrifugation System for Biochemistry Research and Education”, 2015, \$24,981 (**PI: Neil Voss**)
7. Faculty Research and Professional Improvement Leave (Fall semester, 2014)
8. National Science Foundation's Science Talent Expansion Program (NSF-STEP) internal summer research award. Multiple years: 2011: \$500; 2012: \$500; 2014: \$1000; 2015: \$500
9. Consortium PI on “CryoEM studies of a critical GroEL-GroES-polypeptide intermediate,” R01 GM100914-01 (2011; *not funded*)
10. Miller Graduate Student Fellowship Winner (Fall 2000; \$20,000 spread over 4 years)

PUBLICATIONS

Published 23 articles in all peer-reviewed scientific journals. In total, the publications have 1696 citations yielding an h-index of 15 (Web of Science Core Collection, November 9, 2015; <http://www.researcherid.com/rid/K-6244-2012>). List of peer-reviewed publications is below. Using the MEDLINE/PubMed citation format.

Peer-Reviewed Publications

- Fouch K, Piotrowski A, Sharma V, and Voss NR (*to be published exclusively with Roosevelt students*)
Inexpensive 3D Models to Enhance Understanding of Protein Structure.
Biochem Mol Biol Edu. 2019 (*in preparation*)
- Geary C, Chworos A, Verzemnieks E, Voss NR, Jaeger L.
Composing RNA Nanostructures from a Syntax of RNA Structural Modules.
Nano Lett. 2017; 17(11):7095-7101. doi: 10.1021/acs.nanolett.7b03842. PMID: 29039189.
- Sherman MB, Kakani K, Rochon D, Jiang W, Voss NR, Smith TJ.
Stability of Cucumber Necrosis Virus at the Quasi-6-Fold Axis Affects Zoospore Transmission.
J Virol. 2017; 91(19). pii: e01030-17. doi: 10.1128/JVI.01030-17. PMID: 28724762; PMCID: PMC5599764.
- Geary C, Chworos A, Verzemnieks E, Voss NR, Jaeger L.
Composing RNA Nanostructures from a Syntax of RNA Structural Modules.
Nano Lett. 2017 Nov 8;17(11):7095-7101. DOI: 10.1021/acs.nanolett.7b03842.
- Sherman MB, Kakani K, Rochon D, Jiang W, Voss NR, Smith TJ.
Stability of Cucumber Necrosis Virus at the Quasi-6-Fold Axis Affects Zoospore Transmission.
J Virol. 2017 Sep 12;91(19). pii: e01030-17. DOI: 10.1128/JVI.01030-17.
- Sheth LK, Piotrowski AL, Voss NR. (*published exclusively with Roosevelt students*)
Visualization and Quality Assessment of the Contrast Transfer Function Estimation.
J Struct Biol. 2015;192(2):222–34. DOI: 10.1016/j.jsb.2015.06.012
- Marabini R, Carragher B, Chen S, et al. (with two Roosevelt students: Piotrowski AL and Patwari S)
CTF Challenge: Result summary.
J Struct Biol. 2015;190(3):348-59. DOI: 10.1016/j.jsb.2015.04.003

- Fiedler JD, Higginson C, Hovlid ML, *et al.*, Voss NR, Potter CS, Carragher B, Finn MG.
Engineered mutations change the structure and stability of a virus-like particle.
Biomacromolecules. 2012;13(8):2339-48. DOI: 10.1021/bm300590x
- Gibbons BJ, Brignole EJ, Azubel M, Murakami K, Voss NR, Bushnell DA, Asturias FJ, Kornberg RD.
Subunit architecture of general transcription factor TFIIF.
Proc Natl Acad Sci USA. 2012;109(6):1949-54. DOI: 10.1073/pnas.1105266109
- Severcan I, Geary C, Chworos A, Voss N, Jacovetty E, Jaeger L.
A polyhedron made of tRNAs.
Nat Chem. 2010 Sep;2(9):772-9.
- Afonin KA, Bindewald E, Yaghoubian AJ, Voss N, Jacovetty E, Shapiro BA, Jaeger L.
In vitro assembly of cubic RNA-based scaffolds designed *in silico*.
Nat Nanotechnol. 2010 Sep;5(9):676-82. doi: 10.1038/nnano.2010.160.
- Voss NR, Gerstein M.
3V: cavity, channel and cleft volume calculator and extractor.
Nucleic Acids Res. 2010 Jul;38(Web Server issue):W555-62.
- Banerjee D, Liu AP, Voss NR, Schmid SL, Finn MG.
Multivalent display and receptor-mediated endocytosis of transferrin on virus-like particles.
Chembiochem. 2010 Jun 14;11(9):1273-9.
- Katpally U, Voss NR, Cavazza T, Taube S, Rubin JR, *et al.*, Virgin HW 4th, Wobus CE, Smith TJ.
High-resolution cryo-electron microscopy structures of murine norovirus 1 and rabbit hemorrhagic disease virus reveal marked flexibility in the receptor binding domains.
J Virol. 2010 Jun;84(11):5836-41.
- Voss NR, Lyumkis D, Cheng A, Lau PW, *et al.*, Yoshioka C, Carragher B, Potter CS.
A toolbox for *ab initio* 3D reconstructions in single-particle electron microscopy.
J Struct Biol. 2010 Mar;169(3):389-98.
- Voss NR, Potter CS, Smith R, Carragher B.
Software tools for molecular microscopy: an open-text Wikibook.
Methods Enzymol. 2010;482:381-92
- Lyumkis D, Moeller A, Cheng A, Herold A, *et al.*, Quispe JD, Voss NR, Potter CS, Carragher B.
Automation in single-particle electron microscopy: connecting the pieces.
Methods Enzymol. 2010;483:291-338. doi:10.1016/S0076-6879(10)83015-0
- NR Voss*, CK Yoshioka*, M Radermacher, CS Potter, B Carragher
DoG Picker and TiltPicker: tools to facilitate particle selection in single particle electron microscopy.
J Struct. Biol. v166(2): 2009, pp205-13.
- GC Lander, SM Stagg, NR Voss, A Cheng, *et al.*, CS Potter, B Carragher
Appion: an integrated, database-driven pipeline to facilitate EM image processing.
J Struct. Biol. v166(1): 2009, pp95-102.
- SM Stagg, GC Lander, J Quispe, NR Voss, A Cheng, H Bradlow, S Bradlow, B Carragher, CS Potter.
A test-bed for optimizing high-resolution single particle reconstructions.
J Struct. Biol. v163(1): 2008, pp 29-39.

NR Voss, MB Gerstein, TA Steitz, PB Moore

The geometry of the ribosomal polypeptide exit tunnel.

J Mol. Biol. v360(4): 2006, pp 893-906.

NR Voss, MB Gerstein

Calculation of standard atomic volumes for RNA and comparison with proteins: RNA is packed more tightly.

J Mol. Biol. v346(2): 2005, pp 477-492.

M Kammler, MH von Hogen, NR Voss, MC Tringides, A Menzel, EH Conrad

Si(001) step dynamics: A temporal low-energy electron diffraction study.

Phys. Rev. B. v65(7): 2002, article #075312.

J Tsai, NR Voss, MB Gerstein

Determining the minimum number of types necessary to represent the sizes of protein atoms.

Bioinformatics. v17(10): 2001. pp 949-956.

U Nagaswamy, NR Voss, Z Zhang, GE Fox

Database of non-canonical base pairs found in known RNA structures.

Nucl. Acids Res. v28(1): 2000, pp 375-376.

KE Junge, NR Voss, R Lange, JM Dolan, S Zollner, *et al.*, J Kolodzey

Optical properties and band structure of Ge(1-y)C(y) and Ge-rich Si(1-x-y)Ge(x)C(y) alloys.

Thin Solid Films v313: 1998, pp 172-176.

POSTERS AND PRESENTATIONS

NR Voss (**Presentation**)

May 19-20, Lincoln Legacy Teaching and Learning Community, Urbana, IL

<https://lincolnlegacytlc.web.illinois.edu/index.html>

NR Voss (**virtual presentation**)

Open Education Week, March 5, 2025

<https://oeweek.oeglobal.org/>

NR Voss (**Poster**)

YAML Integrity: A Tool for Generating Sharing-Resistant STEM Assessments

2023 Noyce Summit, Transforming Teacher Preparation and Retention

June 26-28 in Washington, DC

<https://www.nsfnoyce.org/2023-noyce-summit/>

G Gillespie, D Jamieson, O Onajole, and NR Voss (**Selected Poster**)

Penta-Fluorination of Phe-Phe Motif to Overcome Homochirality in Hierarchical Self-Assembly of Hydrogels

ACS Fall 2022: Sustainability in a Changing World, Chicago, IL: August 2022

<https://www.acs.org/pressroom/news-room/meeting-news-releases-fall-2022.html>

NR Voss (**Invited Talk**)

The Future of Appion: a Road Map Ahead

Appion Developer Workshop, New York, NY: August 2018

NR Voss (**Invited Talk**)

Appion Developer Workshop, New York, NY: August 2017

NR Voss (**Invited Talk**)

Optimizations of the Appion Source Code; Implementing Legion on JEOL microscopes.

Appion Developer Workshop, New York, NY: August 2015

K Fouch and NR Voss (**Presentation**)

Inexpensive 3D Models to Enhance Understanding in a Biology Lecture Course.
SENCER SCI-Midwest Regional Symposium, North Park, IL: March 2015

NR Voss (**Invited Talk**)

Implementation of Iterative Stable Alignment and Clustering (ISAC) in Appion.
Appion Developer Workshop, La Jolla, CA: July 2014

K Fouch and NR Voss (**Student Presentation**)

Inexpensive 3D Models to Enhance Understanding of Protein Structure.
Science and Math Research Symposium, Chicago, IL: April 2014

K Fouch and NR Voss (**Faculty–Student Joint Presentation**)

Inexpensive 3D Models to Enhance Understanding of Protein Structure.
SENCER SCI-Midwest Regional Symposium, Schaumburg, IL: March 2014

LK Sheth, AL Piotrowski, Q Nasir, and NR Voss (**Student Presentation**)

Visualization and Quality Assessment of the Contrast Transfer Function Estimation.
Science and Math Research Symposium, Chicago, IL: April 2013

LK Sheth, Q Nasir, SH Ali, S Patel, M Ali-Nasar and NR Voss (**Poster**)

Visualization and Comparison of the Contrast Transfer Function Fit across Software Packages.

NRAMM Workshop on Advanced Topics in EM Structure Determination, La Jolla, CA: November 2012

LK Sheth, Q Nasir, SH Ali, S Patel, M Ali-Nasar and NR Voss (**Invited Talk**)

Visualization and Comparison of the Contrast Transfer Function Fit across Software Packages.

Appion Developer Workshop, La Jolla, CA: August 2012

SJ Shenkar, SH Ali, and NR Voss. (**Student Presentation**)

Reduced Computer Processing Particle Alignment with Radon Transforms
Argonne National Lab Symposium for Undergraduate Research, Lemont, IL: October 2011

SJ Shenkar, SH Ali, and NR Voss. (**Invited Talk**)

Recent Developments in EM Structure Determination
Appion Developer Workshop, La Jolla, CA: August 2011

NR Voss (**Invited Presentation**)

Discovery of 3D biomolecular structures by cryo-electron microscopy.
Science and Math Research Symposium, Chicago, IL: April 2011

NR Voss (**Invited Presentation**)

Discovery of 3D biomolecular structures by cryo-electron microscopy.
Science Journal Club, Schaumburg, IL: November 2010

NR Voss, D Lyumkis, E Brignole, A Cheng, PW Lau, et al., CS Potter, and B Carragher. (**Poster**)

A toolbox for *ab initio* reconstructions as applied to several macromolecules.
EM Structure Determination of Challenging Macromolecules, La Jolla, CA: November 2009

NR Voss, D Lyumkis, E Brignole, et al., CS Potter, and B Carragher (**Poster Selected For Presentation**)

A toolbox for the initial model problem.
3DEM Gordon Research Conference, New London, NH: June 2009

- NR Voss, CK. Yoshioka, SM Stagg, J Pulokas, D Fellman, CS Potter, and B Carragher. **(Poster)**
Automated collection and processing of image tilt pairs for initial model reconstruction.
Biophysical Society Annual Meeting, Long Beach, CA: February 2008
- NR Voss, CK. Yoshioka, SM Stagg, et al., CS Potter, and B Carragher. **(Poster & Presentation)**
Automated collection and processing of image tilt pairs for initial model reconstruction.
Advanced Topics in EM Structure Determination, La Jolla, CA: November 2007
- NR Voss, CK. Yoshioka, J Pulokas, D Fellman, CS Potter, and B Carragher. **(Poster Selected For Presentation)**
Automated collection and processing of image tilt pairs for initial model reconstruction.
3DEM Gordon Research Conference, New London, NH: June 2007
- NR Voss, M Gerstein, TA Steitz, PB Moore. **(Presentation)**
Solvent volumes in the Large Ribosomal Subunit and the Geometry of the Polypeptide Exit Tunnel.
RNA Society Meeting. Abstract #122, Banff, AB: May 2005
- M Kammler, M Horn, NR Voss, MC Tringides, A Menzel, E Conrad. **(Poster)**
Dynamics of steps on Si(001) studied by temporal LEED.
Annual American Physical Society Meeting. Abstract #H33.084, March 2002
- KE Junge, NR Voss, R Lange, JM Dolan, S Zollner, et al. **(Poster)**
Optical properties and band structure of Ge(1-y)C(y) and Ge-rich Si(1-x-y)Ge(x)C(y) alloys.
Material Research Society Spring Meeting. Abstract FF3.12, April 1998
- M Hupalo, NR Voss, MC Tringides. **(Poster)**
STM tunneling area determination from tunneling current fluctuations.
Annual American Physical Society Meeting. Abstract #Q28.07, March 1998

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