

Christopher S Own, PhD

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Chris is a Technologist and applied scientist. He is an expert in analytical instrument design and development, specializing in advanced electron microscopy and scientific instruments

His current focus is on developing technical building blocks that catalyze new technologies and that promote improvement of the human experience.

EXPERIENCE

Founder / CEO:

Voxa (Seattle, WA) 2012-present
Advanced scientific instrumentation development and consulting.

BeamDevices, Inc. (Seattle, WA) 2007-2012
Integrated contract design and consulting relating to electron beam systems for universities and research labs.

Ack! Industries, Inc. (Seattle, WA) 2003-present
Manufacturer of innovative digital products and accessories for hi-fi consumer audio.

Principal Research Physicist

Halcyon Molecular (Redwood City, CA) 2009-2012
Principal investigator for a multidisciplinary research team developing 3rd-generation high-throughput low-cost gene sequencing technologies based on electron microscopy (EM).

- Managed grants, publications, and developed intellectual property relating to EM sequencing.
- Developed mixed-signal electronics and software/firmware for high-throughput DNA image acquisition and analysis, acquiring images orders of magnitude faster than past technologies. Sequencer produced world's largest atomic-resolution images of single macromolecules.

Research physicist

Nion Company (Kirkland, WA) 2005-2009
Developed, manufactured, and deployed the world's highest-performance scanning transmission electron microscope, and presented technical talks to international professional audiences.

- Introduced and implemented agile development methodologies to improve team efficiency and accountability.
- Designed, prototyped, and built electron microscope subsystems including the world's greatest precision sample stage, automated sample handling, lens and detector systems, and mixed-signal control electronics.
- Wrote software and firmware for controlling data acquisition systems, electron beam scanning systems, nanoprecision manipulators, and sample handling, and performing image processing.

Research fellow

Northwestern University (Evanston, IL) 1999-2005
Ph.D. in materials physics at the high-resolution EM and surface structure facility.

- Developed first digitally-controlled electron beam precession system for solving atomic structure of crystals.
- Researched shaped nanoparticle and quasicrystal materials systems using transmission and scanning electron microscopy, surface science, and spectroscopy techniques.
- Engineered security, applications deployment, cross-platform networking, and hardware maintenance protocols for Windows networks, Linux, HP/UX, and Aegis workstations, and Rocks supercomputing clusters.
- Supported, managed, and mentored research projects with junior graduate students, mentored middle school students in the Evanston school district on advanced engineering projects.

Chief Photo Editor

The Daily Northwestern (Evanston, IL)

1998-2000

Managed staff of 30 photographers for the daily newspaper at the top US journalism school.

Research assistant

University of North Texas (Denton, TX)

1996-1997

Engineered advanced polymer liquid crystal (PLC) composites at the Laboratory of Polymers and Composites.

PUBLICATIONS

Patents and Patent Applications

1. Own, CS, et al. 2011. *Scanning transmission electron microscopy for polymer sequencing*. US Patent app (allowed).
2. Own, CS, et al. 2011. *Incoherent transmission electron microscopy*. US Patent 8,389,937 B2.
3. Own, CS, et al. 2011. *Aberration-correcting dark-field electron microscopy*. US Patent 8,324,574 B2 (and continuation).
4. Own, CS. 2005. *Digital-to-analog conversion*. US Patent app no: 20050113948.
5. Own, CS, and Marks LD. 2004. *Hollow-cone electron diffraction system*. US Patent app no: 60/531,641.

Peer-reviewed Publications (Selected from 36):

1. Payne A, Andregg A, Kemmish K, Hamalainen M, Howell C, Bleloch A, Klejwa N, Lehrach W, Schatz K, Stark H, Marblestone A, Church GH, Own CS, Andregg W. 2013. *Molecular Threading: Mechanical Extraction, Stretching and Placement of DNA Molecules from a Liquid-Air Interface*. PLOS One 8 (2013) e69058.
2. Krivanek OL, Chisholm MF, Nicolosi V, Pennycook TJ, Corbin GJ, Dellby N, Murfitt MF, Own CS, Szilagy ZS, Oxley MP, Pantelides ST, Pennycook SJ. *Atom-by-atom structural and chemical analysis by annular dark field electron microscopy*. Nature 464 (2010) 571-574. (cover article, >250 citations)
3. Krivanek OL, Ursin JP, Bacon NJ, Corbin GJ, Dellby N, Hrnčirik P, Murfitt MF, Own CS, Szilagy ZS. *High energy resolution monochromator for aberration-corrected scanning transmission electron microscopy/electron energy-loss spectroscopy*. Philosophical Magazine A 367 (2009) 3683-3697.
4. Krivanek OL, Corbin GJ, Dellby N, Elston BF, Keyse RJ, Murfitt MF, Own CS, Szilagy ZS, Woodruff JW. *An electron microscope for the aberration-corrected era*. Ultramicroscopy 108 (2008) 179-195. (>125 citations)
5. Krivanek OL, Dellby N, Keyse RJ, Murfitt MF, Own CS, Szilagy ZS. "Advances in aberration-corrected scanning transmission electron microscopy and electron energy-loss spectroscopy." Advances in Imaging & Electron Physics 153 (2008) 121-160. (book chapter)
6. Ciston J, Own CS, Marks LD. *A quantitative analysis of the cone-angle dependence in precession electron diffraction*. Ultramicroscopy 108 (2008) 514-522.
7. Own CS, Dellby N, Krivanek OL, Marks LD, Murfitt M. *Aberration-corrected precession electron diffraction*. Microscopy and Microanalysis 13 (2007) 96-97.
8. Own CS, Sinkler W, Marks LD. *Prospects for aberration corrected electron precession*. Ultramicroscopy 107 (2007), 534-542.
9. Sinkler W, Own CS, Marks LD. *Application of a 2-beam model for improving the structure factors from precession electron diffraction intensities*. Ultramicroscopy 107 (2007), 543-550.
10. Own CS, Corbin GJ, Dellby N, Elston BF, Keyse RJ, Murfitt MF, Szilagy ZS, Krivanek OL. *High-stability, highly automated double- eucentric (S)TEM sample stage*. Microscopy and Microanalysis 12 (2006) 1104-1105CD.
11. Own CS, Marks LD, Sinkler W. *Precession electron diffraction 1: multislice simulation*. Acta Crystallographica A 62 (2006) 434-443.
12. Own CS, Marks LD, Sinkler W. *Rapid structure determination of a metal oxide from pseudo-kinematical electron diffraction data*. Ultramicroscopy 106 (2006) 114-122.
13. Haes A, Zhao J, Zou S, Own CS, Marks LD, Schatz GC, Van Duyne RP. *Solution-phase, triangular Ag nanotriangles fabricated by nanosphere lithography*. J Phys Chem 109 (2005) 11158-11162. (>75 citations)
14. Own CS, Marks LD, Sinkler W. *Electron precession: a guide for implementation*. Review of Scientific Instruments 76 (2005) 033703.
15. Own CS. *System Design and Verification of the Precession Electron Diffraction Technique*. PhD Thesis (2005). (<http://www.numis.northwestern.edu/Research/Current/precession.shtml>)
16. Own CS, Subramanian AK, Marks LD. *Quantitative analyses of precession diffraction data for a large cell oxide*. Micros and Microanalysis 10 (2004) 96-104.
17. Own CS, Seader D, D'Souza NA, Brostow W. *Cowoven Polypropylene-glass composites with PP+PLC interlayers: dynamic mechanical and thermal analysis*. Polymer Composites 19 (1998) 107-115.

HONORS & AWARDS

Research and Education funding:

- NIH R01 grant (\$2.5M), National Health Genome Research Institute (2009)
- Fannie and John Hertz Foundation Graduate Fellowship (2001)
- National Defense Science and Engineering Graduate (NDSEG) fellowship (2001)
- Walter P. Murphy Fellowship (2000)
- Harold B. Gotaas Undergraduate Research Award (2000) (*granted to best student research in graduating class of McCormick School of Engineering at Northwestern Univ.*)
- Barry M. Goldwater Scholarship (1997)

Conference and Society awards:

- National Institute of Materials Science (NIMS) Conference; Tsukuba, Japan: Lecturer Award (2007)
- International School of Crystallography; Erice, Italy: Scholarship (2004)
- Microscopy and Microanalysis conference: 1st place, instrument and technique (2003)
- Microscopy and Microanalysis conference: Presidential Student Award (2000)
- 5th Internat. Conf. on Polymer Characterization: 3rd place poster (1997)

EDUCATION

Ph.D., Materials Science and Engineering Northwestern University, Evanston, IL 2005

B.S., Materials Science and Engineering Northwestern University, Evanston, IL 2000

Texas Academy of Mathematics & Science University of North Texas, Denton, TX 1997

On-campus resident high school with a college curriculum geared toward a science or engineering degree (graduated with honors).

Languages: Fluent in Mandarin Chinese, C, C++, C#, and VHDL.

Personal: Chris enjoys family life with his wife Lindsey, a middle-school science teacher, and two children, Charlotte and Knox. He currently pursues classical violin, road bicycle racing, hi-fi audio, Argentine Tango, photography, and origami. He also enjoys visiting his wife's science classroom as a guest lecturer and science coach.