

brycebjork

physicist

contact

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connect

scholar.google.com
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personal

Citizenship: US Citizen
Birthdate: 8 Dec. 1988

languages

English native
Spanish proficient

programming

Python, Matlab,
Mathematica, LaTeX,
C/C++, Perl, PHP, Java,
CSS, MySQL, VBA

hobbies

running, road biking,
dancing, backpacking,
snowboarding,
homebrewing, ultimate
frisbee

education

- 2011–Now **Ph.D. Physics, University of Colorado Boulder** Boulder, Colorado
Graduation expected in 2017.
- 2007–2011 **B.A. Physics & Mathematics, Gustavus Adolphus College** Saint Peter, MN
Graduated Cum Laude.

research experience

- 2011 – now **JILA, University of Colorado Boulder** Boulder, CO
Research Assistant
Advisor: Prof. Jun Ye
I am currently investigating applications of cavity-enhanced direct frequency comb spectroscopy (CE-DFCS), including breath analysis using hydrogen peroxide, chemical kinetics of the HO₂ radical, and cold chemistry of buffer gas cooled molecules. I am also working on the development of a new mid-infrared frequency comb source at 10 microns.
- 2011 **University of Colorado Boulder** Boulder, CO
Research Assistant
Advisor: Prof. Markus Rashke
Designed a high-numerical aperture Scattering Scanning Near-Field Optical Microscope (s-SNOM) through modifications to an existing commercial Bruker Atomic Force Microscope (AFM).
- 2010 **California Institute of Technology** Pasadena, CA
Research Assistant
Advisor: Dr. Eric Black
Built an instrument to measure the thermal properties of dielectric mirrors used in LIGO.
- 2009- 2011 **Gustavus Adolphus College** Saint Peter, MN
Research Assistant
Advisor: Prof. Thomas Huber
Investigated the use of novel focused ultrasound techniques for imaging and modal analysis.

professional references

Professor Jun Ye
JILA, NIST and the University of Colorado Boulder
email: ye@jila.colorado.edu

Dr. Eric Black
California Institute of Technology
email: blacke@its.caltech.edu

Professor Thomas Huber
Gustavus Adolphus College
email: huber@gustavus.edu

academic awards

- 2007–2011 **President's Scholarship** Gustavus Adolphus College
Merit-based scholarship.
- 2011 **Minnesota Area Association of Physics Teachers** St. John's University
Award for best student talk.
- 2008 **Harold Q. Fuller Award in Physics** Gustavus Adolphus College
Reserved for first-year student with highest overall record in physics.
- 2010–2011 **Student Research Assistanceship** Gustavus Adolphus College
Merit based award to promote research during classes.

talks

- 2015 **Developments in Cavity-Enhanced Direct Frequency Comb Spectroscopy (CE-DFCS)** Arlington, VA
Team Presentation for DARPA PULSE program.
- 2014 **Frequency Combs and Spectroscopy** Boulder, CO
Outreach talk at CU-PRIME, an organization seeking to educate undergraduates about research opportunities.
- 2014 **Mid-IR Frequency Comb Applications** Austin, TX
Team Presentation for DARPA PULSE program.
- 2014 **Optical Frequency Comb Spectroscopy in the Mid-Infrared for Studying Transient Radicals** Boulder, CO
Invited talk at a local weekly seminar (Bi-Group Seminar).
- 2014 **Time-Resolved Frequency Comb Spectroscopy of Transient Free Radicals in the Mid-Infrared Spectral Region** Urbana, IL
Talk at International Symposium of Molecular Spectroscopy (ISMS).
- 2013 **Sub-millisecond Transient Absorption Frequency Comb Spectroscopy in the Mid-Infrared Spectral Region** Quebec City, Canada
Talk at Division of Atomic, Molecular, and Optical Physics (DAMOP).
- 2013 **Mid-IR Frequency Comb Applications** Arlington, VA
Team presentation at DARPA PULSE Kickoff Meeting.
- 2013 **Quantum limited and cavity-enhanced direct frequency comb spectroscopy in the Infrared** San Francisco, CA
Talk at Photonics West (SPIE).
- 2012 **Developments in Cavity-Enhanced Direct Frequency Comb Spectroscopy (CE-DFCS)** Orange County, CA
Talk at Division of Atomic, Molecular, and Optical Physics (DAMOP).
- 2010 **Selective Excitation of Cantilevers Using Ultrasound** Collegeville, MN
Invited presentation for Minnesota Area Association of Physics Teachers (MAAPT) at St. Johns University.
- 2009 **Noncontact Modal Excitation of Cantilevers Using Ultrasound** Chicago, IL
Presentation at the Mid-States Consortium on a new technique for modal analysis with applications to the characterization of hard drive read heads.

publications

articles in peer-reviewed journals

- Mid-Infrared Time-Resolved Frequency Comb Spectroscopy of Transient Free Radicals
Adam J Fleisher, Bryce J Bjork, Thinh Q Bui, Kevin C Cossel, Mitchio Okumura, Jun Ye
The Journal of Physical Chemistry Letters. 5, 2241–2246 (2014).
- Cavity-enhanced optical frequency comb spectroscopy in the mid-infrared application to trace detection of hydrogen peroxide
A Foltynowicz, P Masłowski, AJ Fleisher, BJ Bjork, J Ye

Applied Physics B. 110, 163–175 (2013).

Mid-infrared virtually imaged phased array spectrometer for rapid and broadband trace gas detection

Lora Nugent-Glandorf, Tyler Neely, Florian Adler, Adam J Fleisher, Kevin C Cossel, Bryce Bjork, Tim Dinneen, Jun Ye, Scott A Diddams

Optics letters. 37, 3285–3287 (2012).

Conference Proceedings

Fourier Transform Direct Frequency Comb Spectroscopy in the Near-and Mid-Infrared

Adam J Fleisher, Bryce J Bjork, Kevin C Cossel, Jun Ye

Fourier Transform Spectroscopy (2013).

Selective excitation using phase shifted ultrasound radiation force from focused transducers in air

Thomas M Huber, Nathaniel Beaver, B Bjork, J Helps, CJ Hunt, DC Mellema

Ultrasonics Symposium (IUS), 2010 IEEE (2010).

non-scientific employment

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| 2008 | SIS Covers | Brooklyn Center, MN |
| | Database technician, implemented upgrade from an old version of MAS90 and MS Access, involving heavy use of Visual Basic for Applications (VBA). | |
| 2008-2011 | Gustabus Adolphus College | Saint Peter, MN |
| | Physics tutor, laboratory teaching assistant, physics department assistant. | |