

Christopher Bergevin

Department of Physics & Astronomy
York University

EDUCATION

- **PhD** (2007)
Massachusetts Institute of Technology Cambridge, MA, USA
Speech and Hearing Bioscience and Technology
Harvard–MIT Health Sciences & Technology Program (HST)
▷ Thesis: *Comparative approaches to otoacoustic emissions:
Towards an understanding of why the ear emits sound*
▷ Advisors: · Prof. Christopher A. Shera (Harvard Medical School)
· Prof. Dennis M. Freeman (MIT)
- **BS** (2000)
University of Arizona Tucson, AZ, USA
Physics & Mathematics (*magna cum laude*)

EMPLOYMENT

- *Assistant Professor* Fall 2012–
▷ York University, Department of Physics & Astronomy
Toronto, ON, Canada
- *Post-Doctoral Research Scientist* Fall 2010– Summer 2012
▷ Columbia University, Dept. of Otolaryngology/Head & Neck Surgery
New York, NY, USA
- *Visiting Assistant Professor* Fall 2007–Summer 2010
▷ University of Arizona, Department of Mathematics
Tucson, AZ, USA
- *Senior Research Technician* Fall 2001–Winter 2002
▷ Massachusetts Eye & Ear Infirmary, Eaton–Peabody Laboratory
Boston, MA, USA

PEER- REVIEWED PUBLICATIONS

11. Bergevin C & Olson E *External and middle ear sound pressure distribution and acoustic coupling to the tympanic membrane*. J. Acoust. Soc. Am. **(2014)** 135:1294–1312
10. Shera CA & Bergevin C *Obtaining reliable phase-gradient delay trends from otoacoustic emission data*. J. Acoust. Soc. Am. **(2012)** 132:927-943
9. Bergevin C, Walsh EJ, McGee J, & Shera CA *Probing cochlear tuning and tonotopy in the tiger using otoacoustic emissions*. J. Comp. Physiol. A **(2012)** 198:617-624
8. Bergevin C, Fulcher A, Richmond S, Velenovsky D, Lee J *Interrelationships between spontaneous & low-level stimulus-frequency otoacoustic emissions in humans*. Hear. Res. **(2012)** 285:20-28
7. Joris* PX, Bergevin* C, Kalluri R, Mc Laughlin M, Michelet P, van der Heijden M, & Shera C *Frequency selectivity in Old World monkeys corroborates sharp cochlear tuning in humans*. Proc. Nat. Acad. Sci. USA **(2011)** 108(42):17516-17520 [* - joint first authors]

6. Bergevin C *Comparison of Otoacoustic Emissions Within Gecko Sub-Families: Morphological Implications for Auditory Function in Lizards*. J. Assoc. Res. Otolaryngol. (2011) 12:203-217
 5. Bergevin C, Velenovsky D, & Bonine KE *Tectorial Membrane Morphological Variation: Effects Upon Stimulus Frequency Otoacoustic Emissions*. Biophys. J. (2010) 99:1064-1072
 4. Bergevin C & Shera CA *Coherent reflection without traveling waves: On the origin of long-latency otoacoustic emissions in lizards*. J. Acoust. Soc. Am. (2010) 127:2398-2409
 3. Bergevin C *BioMath: Towards Improving the Integration of Undergraduate Biology and Mathematics Education*. J. Microbio. & Bio. Edu. (2010) 11:28-33
 2. Melcher JR, Levine RA, Bergevin C, & Norris B *The Auditory Midbrain of People with Tinnitus: Abnormal Sound-Evoked Activity Revisited*. Hear. Res. (2009) 257:63-74
 1. Bergevin C, Freeman D, Saunders J, & Shera C *Otoacoustic emissions in humans, birds, lizards, & frogs: Evidence for multiple generation mechanisms*. J. Comp. Physiol. A (2008) 194: 665-683
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10. Bergevin C, Manley GA, & Köppl C (2014) *Otoacoustic interrelationships of the barn owl* [in press]
 9. Bergevin C & Salerno A (2014) *Dynamics of spontaneous otoacoustic emissions* [in press]
 8. Bergevin C, Meenderink SWF, van der Heijden M, & Narins, PM (2014) *Slow dynamics of the amphibian tympanic membrane* [in press]
 7. Manley GA, Köppl C, & Bergevin C (2014) *Common substructure in otoacoustic emission spectra of land vertebrates* [in press]
 6. Bergevin C, Velenovsky D, & Bonine KE (2011) *Coupled, Active Oscillators and Lizard Otoacoustic Emissions*. What Fire is in Mine Ears: Progress in Auditory Biomechanics (AIP)
 5. Binder AJ, Aranyosi AJ, & Bergevin C (2011) *Stiffness vs Damping in the Cochlea: A Negative Conclusion?*. What Fire is in Mine Ears: Progress in Auditory Biomechanics (AIP)
 4. Bergevin C, Epp B, & Meenderink S (2011) *MoH 101: Basic Concepts in the Mechanics of Hearing*. What Fire is in Mine Ears: Progress in Auditory Biomechanics (AIP)
 3. Shera C, Bergevin C, Kalluri R, Mc Laughlin M, Michelet P, van der Heijden M, & Joris P (2011) *Otoacoustic Estimates of Cochlear Tuning: Testing Predictions in Macaque*. What Fire is in Mine Ears: Progress in Auditory Biomechanics (AIP)
 2. Bergevin C & Shera CA (2009) *Modeling otoacoustic emission delays in the lizard ear*. Concepts and Challenges in The Biophysics of Hearing (World Scientific, Singapore) pg. 85-90
 1. Bergevin C, Freeman DM, & Shera CA (2006) *Comparing otoacoustic emissions in the gecko and human*. Auditory Mechanisms: Processes and Models (World Scientific, Singapore) pg. 388-389

PEER-
REVIEWED
CONFERENCE
PROCEEDINGS

**CONFERENCE
PRESENTATIONS**

31. Bergevin C (GRC, **2014**) *Recasting coherent reflection* [**Invited Talk**]
30. Bergevin C, Meenderink SWF, van der Heijden M, & Narins, PM (CAP, **2014**) *Slow to hear: Traveling waves on the eardrum*
29. Bergevin C (Cell Dynamics Workshop, **2014**) *Dynamics of auditory hair cells*
28. Salerno A & Bergevin C (Neuroscience Association at York Symposium, **2014**) *Stimulating spontaneous sound emission from the ear*
27. Köppl C, Manley GA, & Bergevin C (ARO, **2014**) *Interrelations between otoacoustic emission delays and neural tuning in the barn owl*
26. Sumner CJ, Wells TT, Bergevin C, Palmer AR, Oxenham AJ, & Shera CA (ARO, **2014**) *Comparing otoacoustic, auditory-nerve, and behavioral estimates of cochlear tuning in the ferret*
25. Ni C & Bergevin C (CUPC, **2013**) *Reverse-engineering the Copernican Revolution: Exploring how inverse problems lead to models*
24. Wells TT, Sumner CJ, Palmer AR, Oxenham AJ, Shera CA, & Bergevin C (British Society for Audiology, **2013**) *Frequency selectivity measured behaviourally in the ferret using forward masking*
23. Bergevin C, Dong W, Carney L, Velenovsky DS, Bonine KE, & Jarchow JL (ASA, **2013**) *Comparative auditory biomechanics probed by otoacoustic emissions* [**Invited Talk**]
22. Gonzalez-Herrera A, Wattamwar K, Bergevin C, & Olson ES (ASA, **2013**) *Sound transmission in a simple model of the ear canal and tympanic membrane*
21. Bergevin C, Dong W, & Carney L (ARO, **2013**) *Probing otoacoustic emissions in the budgerigar (*Melopsittacus undulatus*)*
20. Bergevin C & Olson E (ARO, **2012**) *Acoustics of the ear canal and middle ear cavity probed with high spatial resolution*
19. Epp, B, Bergevin C & Shera C (ARO, **2012**) *Relationships between cochlear tuning and delay probed with a nonlinear transmission-line model*
18. Bergevin C (ASA, **2011**) *Otoacoustic emission delays as a probe to measure cochlear tuning: Comparative validations*
17. Bergevin C, McDermott J, Roy S, Li F, Shera C, & Wang X (ARO, **2011**) *Stimulus-frequency otoacoustic emissions as a probe of cochlear tuning in the common marmoset*
16. Brandt C, Bergevin C, Velenovsky D, Bonine KE, & Christensen-Dalsgaard J (ARO, **2011**) *Auditory brainstem responses and OAEs in lizards: Comparisons across species and temperatures*
15. Bergevin C, Walsh E, McGee J, & Shera C (ARO, **2011**) *Using otoacoustic emissions to explore cochlear tuning and tonotopy in the tiger*
14. Bergevin C (ARO, **2011**) *Otoacoustic emission methodology: A non-invasive probe to inner ear function*
13. Bergevin C & Shera C (SIAM, Conf. on the Life Sciences, **2010**) *What fire is in mine ears?*

12. Bergevin C, Walsh E, McGee J, & Shera C (Eastern Auditory Retreat, Columbia University, **2010**) *Effects of size upon stimulus-frequency otoacoustic emission delays: A survey into the tiger ear*
11. Bergevin C, Velenovsky D, & Bonine KE (ARO, **2010**) *Otoacoustic emission temperature dependence across the Lacertilia*
10. Richmond S, Gonzales A, Bergevin C, Velenovsky D, Smith B, & Lee J (ARO, **2010**) *Exploring the interrelationship between spontaneous and low-level stimulus-frequency OAEs*
9. Bergevin C & Shera C (SIAM, Conf. on Dynamical Systems, **2009**) *Long time coming: Modeling sound emission from the ear* [**Invited Talk**]
8. Bergevin C (American Society for Microbiology, Conference for Undergraduate Educators, **2009**) *Integrating pedagogy in biology and mathematics* [**Invited Talk**]
7. Bergevin C & Shera CA (ARO, **2009**) *Modeling stimulus-frequency otoacoustic emission in the lizard ear*
6. Binder A & Bergevin C (AMS, **2009**) *Exploring nonlinear oscillator models for the auditory periphery*
5. Bergevin C, Kalluri R, & Shera CA (ARO, **2008**) *Stimulus-frequency OAE phase-gradient delays in non-human primates*
4. Bergevin C & Shera CA (Mathematical Biosciences Institute at Ohio State University, **2007**) *Are basilar-membrane traveling waves necessary for long OAE delays?*
3. Bergevin C, Freeman DM, & Shera CA (ARO, **2007**) *Otoacoustic emissions in humans, birds, lizards and amphibians: A comparative study reveals differences in emission generation mechanisms*
2. Bergevin C, Freeman DM, & Shera CA (ARO, **2006**) *A comparative study of otoacoustic emissions in geckos and humans*
1. Bergevin C & Steinke S (AMS, **1999**) *Synchronization of chaotic maps*

AIP \equiv American Institute of Physics
AMS \equiv American Mathematical Society
ARO \equiv Association for Research in Otolaryngology
ASA \equiv Acoustical Society of America
CAP \equiv Canadian Association of Physicists
CUPC \equiv Canadian Undergraduate Physics Conference
GRC \equiv Gordon Research Conference
MoH \equiv Mechanics of Hearing
SIAM \equiv Society for Industrial and Applied Mathematics

**TEACHING
EXPERIENCE**

- Physics 2030 – *Computational methods for physicists and engineers* Fall 2014 (York)
- Biophysics 4090 – *Biophysics II* 2012–2014 (York)
- Physics 1410 – *Physical Science* Winter 2013 (York)
- Biophysics 3090 – *Biophysics I* 2013–2015 (York)
- Physics 4310 – *Project Course* 2013–2014 (York)
- Mathematics 250A,B – *Calculus & Differential Equations* Fall 2009–Spring 2010 (AZ)
- Mathematics 485/585 – *Mathematical Modeling* (mentor) Spring 2008, 2010 (AZ)
- Mathematics 475 – *Numerical Methods* (project mentor) Spring 2010 (AZ)
- Mathematics 250A,B – *Calculus & Differential Equations* Fall 2007–Spring 2009 (AZ)
- Mathematics 363 – *Calculus-Based Statistics for Life Sciences* (Co-Inst.) Spring 2009

(AZ)

- Physiology 472 – *Quantitative Modeling of Biological Systems* (Co-Inst.) Fall 2008, 2009 (AZ)
- Mathematics 129 – *Calculus II* Spring 2008 (AZ)
- Mathematics 596a – *Quantitative Biology Colloquium* (Co-Inst.) Spring 2008 (AZ)
- HST 750 – *Modeling Issues in Speech & Hearing* (Teach. Asst.) Spring 2006 (MIT)
- HST 714 – *Acoustics of Speech & Hearing* (Teach. Asst.) Fall 2005 (MIT)

INVITED TALKS

- McMaster University, Dept. of Physics (**2013**)
- University of Rochester, Dept. of Mechanical Engineering (**2013**)
- Technical University of Denmark, Dept. of Electrical Engineering (**2013**)
- Carl von Ossietzky University of Oldenburg (**2013**)
- University of California, Los Angeles, Dept. of Physics (**2013**)
- Acoustical Society of America, ICA 2013 (**2013**)
- University of Nottingham (**2012**)
- VA Loma Linda Healthcare System (**2012**)
- House Research Institute (**2012**)
- Rutgers University, Dept. of Biology (**2012**)
- Columbia University, Dept. of Biomedical Engineering (**2012**)
- University of Rochester, Dept. of Neurobiology & Anatomy (**2011**)
- Massachusetts Institute of Technology, Program in Art, Culture and Technology (**2011**)
- University of Maryland, Dept. of Biology (**2011**)
- Johns Hopkins University, Hearing & Balance Science seminar (**2011**)
- Boston University, Hearing Research Center seminar (**2011**)
- Northwestern University, Dept. of Communication Sciences & Disorders (**2010**)
- American Society for Microbiology, Conference for Undergraduate Educators (**2010**)
- University of Arizona, Tucson Teacher's Circle (**2010**)
- Johns Hopkins University (**2010**)
- Columbia University (**2010**)
- SIAM, Conference on Applications of Dynamical Systems (**2009**)
- Rockefeller University (**2008**)
- Boys Town National Research Hospital (**2008**)
- Arizona State University, Dept. of Speech & Hearing Science (**2008**)
- University of Arizona (various, **2007–2010**)
- Boston University, Hearing Research Center seminar (**2006**)
- Massachusetts Institute of Technology, Division of Comparative Medicine (**2006**)

PROFESSIONAL ACTIVITIES & AWARDS

Grants & Fellowships

- York Junior Faculty Fund (2014)
- Natural Sciences and Engineering Research Council of Canada (NSERC), Discovery Grant (2013-2018)
- NSERC, Undergraduate Student Research Award [mentor] (2013)
- Biophysical Society, Networking Mini-Grants [organizer] (2011)
- American Speech-Language-Hearing Foundation, New Century Scholars Research Grant, Co-investigator w/ Jungmee Lee (PI) (2008)
- National Science Foundation, Vertical Integration of Research and Education in the Mathematical Sciences (VIGRE) & the Howard Hughes Medical Institute, Post-Doctoral Fellowship (2007–2010)
- National Institute on Deafness and other Communication Disorders (NIDCD) Graduate Fellowship (2002–2006)
- National Science Foundation, Research Experience for Undergraduates (REU) Fellowship, Cornell University (1999)

- NASA/Arizona Space Grant Consortium, Undergraduate Research Internship Program (1998)

Professional Memberships

- Canadian Association of Physicists 2013–
- Centre for Vision Research, York University 2013–
- Biophysical Society 2011–
- Society for Industrial and Applied Mathematics (SIAM) 2009–
- American Society for Microbiology (ASM) 2009–
- American Acoustical Society (ASA) and American Institute of Physics (AIP) 2007–
- Association for Research in Otolaryngology (ARO) 2006–

Organizer

- Mechanics of Hearing, lead organizer (2017)
- Columbia University, conference: *Sense to Synapse: Biophysical Mechanisms of Perception* (2012)
- Mechanics of Hearing, workshop: ‘*MoH 101*’ (2011, 2014)
- Acoustical Society of America, special session: ‘*Comparative Approaches Towards Peripheral Auditory Function*’ (2011)
- ARO, workshop: ‘*Research Techniques & Approaches 101*’ (2011)
- SIAM Conference on the Life Sciences, mini-symposium: ‘*Auditory Biophysics: Power Amplification In the Inner Ear*’ (2010)
- Mechanics of Hearing, workshop: ‘*MoH 101*’ (2008)

Other

- Associate member of the Graduate Program in Psychology (York, 2013–)
- Science Rendezvous (York, May 2013)
- Member of Curriculum Committee (York, May 2012–2013)
- Mentor for Summer Undergraduate Research Fellowships (Columbia, Summer 2011)
- External member of PhD committee for S. Henin, City University of New York, Graduate Center (2011–2012)
- School of Natural Resources (U. of Arizona) Photography Contest, 1st Place in *Scenic* category (2010)
- Mentor to Undergraduate Research Assistantship (URA, G. Vanhoy, A. Salce; 2010)
- Teaching Service Award, Dept. Of Mathematics, U. of Arizona (2009)
- Member of iUBRP admissions committee, U. of Arizona (2009)
- Outreach talks to mathematics classes at local high schools (2009)
- External member of PhD committee for M. Gelfand, Rockefeller University (2008)
- Theoretical neuroscience journal club, U. of Arizona (2007–2010)
- Member of BioMath committee, U. of Arizona (2007–2010)
- Mentor for Undergraduate Research Assistantship (URA, A. Binder; 2008–2009)
- Mentor for Undergraduate Biology Research Program (UBRP, 2008)
- Disc Jockey at KAMP (2000), WMFO (2001–2002), WMBR (2002–2007)
- Lecturer to SHBT graduate students on statistics and data analysis (2005–2006)
- Member of MIT SHBT admissions committee (2005–2007)
- Head of MIT Auditory Mechanics journal club (2004–2006)
- Outstanding Senior Award, Dept. Of Mathematics, University of Arizona (2000)
- Reviewer: Biomechanics and Modeling in Mechanobiology, Ear & Hearing, J. Acoust. Soc. Am., J. Assoc. Res. Otolaryngol., J. Neurophysio., J. Neurosci., J. Roy. Soc. Interf., NSERC, Science, SIAM

**PREVIOUS
RESEARCH
EXPERIENCE**

- Stereociliary bundle physiology in bullfrog saccular hair cells, Harvard Medical School (2003)
- fMRI study of auditory cortex in patients with tinnitus, Massachusetts Eye & Ear Infirmary (2001–2003)
- Laser tweezer study characterizing cell membrane biophysics, University of Arizona (1999–2001)
- Development of thermometry system with sub-millikelvin resolution operating near absolute zero for testing of super-conducting rf cavities, Cornell University (1999)
- Development of an infrared spectroscopy system for planetological applications, Innovative Lasers (1998–1999)
- Applications for the synchronization of chaotic systems, University of Arizona (1997–1999)

**PROFESSIONAL
REFERENCES**

- Prof. Dennis Freeman †
Massachusetts Institute of Technology (Elec. Engineering & Comp. Science)
▷ freeman@mit.edu
- Prof. Joceline Lega †
University of Arizona (Mathematics)
▷ lega@math.arizona.edu
- Prof. Marshall McCall
York University (Physics & Astronomy)
▷ mccall@yorku.ca
- Prof. Christopher Shera †
Harvard Medical School (Otology & Laryngology)
▷ shera@epl.meei.harvard.edu

† – primary reference

CONTACT

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