

Samuel D. Bellows, Ph.D.

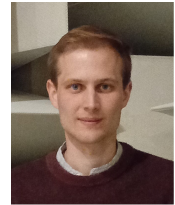
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🌐 Samuel Bellows

📍 Sorbonne University



Academic Appointments

2023-2024 **Post-doctoral Researcher**, Sorbonne University, Paris, France.

Education

- 2023 **Ph.D., Brigham Young University** Physics.
Dissertation title: *Acoustic Directivity: Advances in Acoustic Center Localization, Measurement Optimization, Directional Modeling, and Sound Power Spectral Estimation.*
- 2019 **B.Sc., Brigham Young University** Applied Physics. Minors: Music and Italian.
Thesis title: *Analysis of Directivity Factors and Indices of Human Speech.*

Research Publications and Presentations

Journal Articles

- 1 S. D. Bellows and T. W. Leishman, "Application of Chebyshev quadrature rules to equiangular spherical and hemispherical directivity measurements," *J. Audio Eng. Soc.*, vol. 72, no. 1/2, pp. 44–58, 2024. [DOI: https://doi.org/10.17743/jaes.2022.0119](https://doi.org/10.17743/jaes.2022.0119).
- 2 S. D. Bellows, D. T. Harwood, K. L. Gee, and M. R. Shepherd, "Directional characteristics of two gamelan gongs," *J. Acoust. Soc. Am.*, vol. 154, no. 3, pp. 1921–1931, Sep. 2023. [DOI: 10.1121/10.0021055](https://doi.org/10.1121/10.0021055).
- 3 S. D. Bellows and T. W. Leishman, "Low-frequency radiation from a vibrating cap on a rigid spherical shell with a circular aperture," *J. Acoust. Soc. Am.*, vol. 154, no. 6, pp. 3883–3898, Dec. 2023. [DOI: 10.1121/10.0023936](https://doi.org/10.1121/10.0023936).
- 4 S. D. Bellows and T. W. Leishman, "On the low-frequency acoustic center," *J. Acoust. Soc. Am.*, vol. 153, no. 6, pp. 3404–3418, Jun. 2023. [DOI: 10.1121/10.0019750](https://doi.org/10.1121/10.0019750).
- 5 S. D. Bellows and T. W. Leishman, "Optimal microphone placement for single-channel sound-power spectrum estimation and reverberation effects," *J. Audio Eng. Soc.*, vol. 71, no. 1/2, pp. 20–33, Jan. 2023. [DOI: 10.17743/jaes.2022.0052](https://doi.org/10.17743/jaes.2022.0052).
- 6 T. W. Leishman, S. D. Bellows, C. M. Pincock, and J. K. Whiting, "High-resolution spherical directivity of live speech from a multiple-capture transfer function method," *J. Acoust. Soc. Am.*, vol. 149, no. 3, pp. 1507–1523, 2021. [DOI: 10.1121/10.0003363](https://doi.org/10.1121/10.0003363).

Conference Proceedings

- 1 S. D. Bellows and T. W. Leishman, "A spherical-harmonic-based framework for spatial sampling considerations of musical instrument and voice directivity measurements," in *Proceedings of Forum Acusticum*, Turin, Italy, 2023.
- 2 S. D. Bellows and D. Nakayama, "Modeling and measurements of the f-hole shape's influence on the bending modes of a fractional-size violin," in *Proceedings of Forum Acusticum*, Turin, Italy, 2023.
- 3 S. D. Bellows, M. R. Shepherd, K. L. Gee, and T. W. Leishman, "Modeling the sound radiation of gamelan gongs using analytic rigid spherical models," in *Proc. Meet. Acoust.*, vol. 51, Oct. 2023, p. 035 003. [DOI: 10.1121/2.0001754](https://doi.org/10.1121/2.0001754).

- 4 J. E. Avila, S. D. Bellows, T. W. Leishman, and K. L. Gee, "Directivity analysis of the muted trumpet," in *Proc. Mtgs. Acoust.* 50, 035005, Dec. 2022. [DOI: 10.1121/2.0001738](#).
- 5 S. D. Bellows and T. W. Leishman, "A spherical beamforming algorithm for acoustic centering and phase correction of source directivities," in *Proceedings of the 24th International Congress on Acoustics*, Gyeongju, South Korea, Oct. 2022.
- 6 S. D. Bellows and T. W. Leishman, "Modeling and measurements of organ pipe sound radiation," in *Proceedings of the 24th International Congress on Acoustics*, Gyeongju, South Korea, Oct. 2022.
- 7 S. Bellows and T. W. Leishman, "Effect of head orientation on speech directivity," in *Proceedings of Interspeech 2022*, 2022, pp. 246–250. [DOI: 10.21437/Interspeech.2022-553](#).
- 8 S. D. Bellows and T. W. Leishman, "Modeling musician diffraction and absorption for artificially excited clarinet directivity measurements," in *Proc. Mtgs. Acoust.* 46, 035002, 2022. [DOI: 10.1121/2.0001586](#).
- 9 S. D. Bellows, D. T. Harwood, K. L. Gee, and T. W. Leishman, "Low-frequency directional characteristics of a gamelan gong," in *Proc. Meet. Acoust.* 50, 035003, 2022. [DOI: 10.1121/2.0001722](#).
- 10 S. Bellows and T. Leishman, "Single-channel sound power estimation for reverberation effects," in *Audio Engineering Society Convention 149*, Oct. 2020.
- 11 S. D. Bellows and T. W. Leishman, "Acoustic source centering of musical instrument directivities using acoustical holography," in *Proc. Mtgs. Acoust.* 42, 055002, 2020. [DOI: 10.1121/2.0001371](#).
- 12 S. D. Bellows and T. W. Leishman, "Obtaining far-field spherical directivities of guitar amplifiers from arbitrarily shaped arrays using the helmholtz equation least-squares method," 2020. [DOI: 10.1121/2.0001410](#).
- 13 S. D. Bellows and T. W. Leishman, "High-resolution analysis of the directivity factor and directivity index functions of human speech," in *Audio Engineering Society Convention 146*, 2019.
- 14 S. D. Bellows and T. W. Leishman, "Spherical harmonic expansions of high-resolution musical instrument directivities," in *Proc. Mtgs. Acoust.* 35, 035005, 2018. [DOI: 10.1121/2.0001274](#).

Other Presentations

- 1 S. D. Bellows and T. W. Leishman, "An investigation of rooms with reflection-free zones using finite-difference methods in curvilinear coordinates," in *Acoustical Society of America Spring Meeting*, 2023.
- 2 S. D. Bellows and T. W. Leishman, "Comparative analysis of the directivity of the sogeum and danso," in *Korean Acoustical Society Fall Meeting*, 2022.
- 3 R. C. Edelman, B. E. Anderson, S. D. Bellows, and T. W. Leishman, "Measured high-resolution directivities of guitar amplifiers," in *Acoustical Society of America Spring Meeting*, 2022.
- 4 D. T. Harwood, S. D. Bellows, J. E. Avila, and K. L. Gee, "A comparative study of the directional characteristics of two gamelan gongs," in *Acoustical Society of America Fall Meeting*, 2022.
- 5 S. Bellows and T. W. Leishman, "Application of Hilbert space operators on the sphere to directivity measurements," in *Acoustical Society of America Fall Meeting*, 2019.
- 6 R. C. Edelman, S. Bellows, and T. W. Lieshman, "An archival database of high-resolution directivities," in *Acoustical Society of America Fall Meeting*, 2019.

Research Experience

- 2023-2024 **Postdoctoral Researcher** Institut Jean le Rond d'Alembert, Sorbonne University
- Modeling acoustics in virtual reality, including HRTF preferences and voice directivity.
 - Studies in room acoustics including geometrical acoustics calibration and coupled volume rooms.
- 2017-2023 **Research Assistant** Acoustics Research Group, Brigham Young University
- High-resolution spherical directivity measurements of musical instruments.
 - Theoretical modeling of sound radiation from vibrating structures.
 - Development of acoustic source centering algorithms.
 - Single-channel sound power spectral estimation using known directivity functions.

Professional Experience

- 2023 **Consultant** Institute for Scientific Research in Music
- Physical modeling of the trombone using a FDTD implementation of the Horn equation.
- 2022 **Intern** Yamaha Corporation
- SLDV and radiativity measurements of violins to compare modal behavior.
 - Developed parameterized CAD model of violin f-hole to study impact of f-hole shape on structural modes and radiated sound power.
- 2019-2022 **Intern and Consultant** Ahnert Feistal Media Group (AFMG)
- Developed real-time binaural convolver with head-tracking in C++ for room auralizations based on echograms created in EASE.
 - Room acoustic measurements and creation of CAD models.

Teaching and Mentoring

- 2019-2023 **Undergraduate Mentor** Acoustics Research Group
- Assisted in mentoring six undergraduates with research projects including three with the research necessary for their senior thesis.
- 2019 **Teaching Assistant** Acoustical Measurement Methods
- Teaching assistant for graduate-level course on acoustical measurement techniques.

Skills

Coding	MATLAB, Python, C++, Mathematica
Software	Comsol, Ansys, SolidWorks
Languages	English (Fluent), Italian (C1), French (B1), Japanese (JLPT3), Korean (TOPIK 3)

Awards and Achievements

- 2021-2023 **William James Strong and Charlene Fuhriman Strong Family Musical Acoustics Endowed Fellowship Fund**, Recipient.
- 2023 **Best Student Presentation, 2nd Place**, Acoustical Society of America Spring 2023 Meeting.

Awards and Achievements (continued)

- 2022 **Best Student Paper**, POMA Student Paper for Acoustical Society of America Spring 2022 Meeting.
- 2013 **Heritage Scholarship**, Recipient.

Service and Society Involvement

- 2022-2023 **Signal Processing Student Council Representative**, Acoustical Society of America.
- 2023 **Acoustical Society of America**, Member.
- Audio Engineering Society**, Member.

References

Available on request.