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THE BREAKTHROUGH LISTEN SEARCH FOR EXTRATERRESTRIAL TECHNOLOGIES**Andrew P. V. Siemion***Department of Astronomy, University of California, Berkeley, 501 Campbell Hall, Berkeley, CA, 94720-3411*

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We will report on the status of, and latest results from, the Breakthrough Listen search for advanced life beyond the Earth. Breakthrough Listen currently employs two radio telescopes (the Green Bank Telescope, Green Bank, WV, USA and the Parkes Telescope, NSW, Australia) and one optical telescope (the Automated Planet Finder, Lick Observatory, CA, USA) to conduct searches of nearby stars, nearby galaxies, our own galactic plane and exotic objects (e.g. KIC 8462852) for evidence of advanced life beyond the Earth. Future extensions to the program may include all-sky searches at radio and optical wavelengths and commensal programs on wide-field array telescopes (e.g. MeerKAT).

I. PEER-REVIEWED PUBLICATIONS

The Breakthrough Listen Team has produced seven peer-reviewed publications covering a range of technical and scientific topics related to the program.

[1] H. Isaacson, A. P. V. Siemion, G. W. Marcy, M. Lebofsky, D. C. Price, D. MacMahon, S. Croft, D. DeBoer, J. Hickish, D. Werthimer, S. Sheikh, G. Hellbourg, and J. E. Enriquez. The Breakthrough Listen Search for Intelligent Life: Target Selection of Nearby Stars and Galaxies. *PASP*, 129(5):054501, May 2017.

[2] D. H. E. MacMahon, S. Croft, D. DeBoer, J. E. Enriquez, V. Gajjar, G. Hellbourg, H. Isaacson, M. Lebofsky, D. C. Price, A. P. V. Siemion, and D. Werthimer. The Breakthrough Listen Search for Intelligent Life: A WIDEBAND DATA RECORDER SYSTEM FOR THE ROBERT C. BYRD GREEN BANK TELESCOPE. *PASP*, 2017.

[3] N. K. Tellis and G. W. Marcy. A Search for Laser Emission with Megawatt Thresholds from 5600 FGKM Stars. *AJ*, 153:251, June 2017.

[4] S. P. Worden, J. Drew, A. P. V. Siemion, D. Werthimer, D. DeBoer, S. Croft, D. MacMahon, M. Lebofsky, H. Isaacson, J. Hickish, D. Price, V. Gajjar, and J. T. Wright. Breakthrough listen – a new search for life in the universe. *Acta Astronautica*, 139:98 – 101, 2017.

[5] J. T. Wright. Prior Indigenous Technological Species. *International Journal of Astrobiology* (in press), arXiv:1704.07263, 2017.

[6] J. T. Wright and M. P. Oman-Regan. Visions of Human Futures in Space and SETI. *International Journal of Astrobiology* (accepted), 2017.

[7] J. T. Wright and S. Sigurdsson. Families of Plausible Solutions to the Puzzle of Boyajian’s Star. *ApJ*, 829:L3, Sept. 2016.

II. PUBLICATIONS IN PREPARATION

The Breakthrough Listen Team has seven journal articles in preparation.

[1] B. Barsdell, D. C. Price, and et al. Bifrost: a Python/C++ Framework for High-Throughput Stream Processing in Astronomy. *AJ*, 2017.

[2] S. Croft, A. P. V. Siemion, J. E. Enriquez, U. Haji, M. Lebofsky, D. DeBoer, V. Gajjar, G. Hellbourg, J. Hickish, H. Isaacson, D. MacMahon,

D. C. Price, and D. Werthimer. A Breakthrough Listen Search for Engineered Signals from the Terrestrial Exoplanet LHS 1140b. *AJ*, 2017.

[3] J. Enriquez, A. Siemion, D. C. Price, D. MacMahon, M. Lebofsky, I. H., G. Hellbourg, V. Gajjar, S. Croft, and D. Werthimer. The Breakthrough Listen Search for Intelligent Life: 1.1-1.9 GHz Observations of 692 Nearby Stars. 2017.

[4] D. Forgan, J. T. Wright, J. Tarter, E. Korpela, A. Siemion, I. Almar, and E. Ptielat. Rio 2.0 - Revising the Rio Scale for SETI Detections. *Astrobiology*, in prep.

[5] V. Gajjar, A. Siemion, D. C. Price, D. MacMahon, M. Lebofsky, H. Isaacson, G. Hellbourg, J. Enriquez, S. Croft, and D. Werthimer. The Breakthrough Listen Search for Advanced Life: Searching for narrow-band transmission towards Fast Radio Bursts. 2017.

[6] M. Lebofsky et al. The Breakthrough Listen Search for Intelligent Life: Data Formats, Reduction and Archiving. *PASP*, 2017.

[7] D. C. Price et al. Breakthrough Listen: Digital instrumentation for the Parkes 64-m telescope. PASP, in. prep.

III. OTHER PUBLICATIONS

The Breakthrough Listen Team has produced five non-peer-reviewed publications.

[1] T. Boyajian, S. Croft, J. Wright, A. Siemion, M. Muterspaugh, M. Siegel, B. Gary, S. Wright, J. Maire, A. Duenas, C. Hultgren, and J. Ramos. A Drop in Optical Flux from Boyajian's Star. The Astronomer's Telegram, No. 10405, 405, May 2017.

[2] Breakthrough Listen Team. Breakthrough Listen at UC Berkeley to conduct follow up observations of reported anomalous spectral features in solar type stars. Breakthrough Listen Memo Series, 2017.

[3] S. Croft, A. Siemion, D. MacMahon, M. Lebofsky, H. Isaacson, J. Hickish, D. Price, D. Werthimer, V. Gajjar, and D. DeBoer. Breakthrough

Listen Follow-up of a Transient Signal from the RATAN-600 Telescope in the Direction of HD164595. Breakthrough Listen Memo Series, 2017.

[4] J. T. Wright. Exoplanets and SETI. In H. J. Deeg and J. A. Belmonte, editors, Handbook of Exoplanets. Springer Nature, 2017.

[5] J. T. Wright. Future Paths for Artifact SETI. white paper accepted to Community Input for the Advancement of the Search for Intelligent Life in the Universe, and the Creation of a Multidisciplinary Virtual Institute for SETI Research, ed. Natalie Cabrol, 2017.