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EDUCATION

PhD—*Physics,* Universität Heidelberg, 1987, *cum laude*
MS—*Astronomy*, San Diego State University, 1979
BS—*Astronomy*, San Diego State University, 1974, (minors *Mathematics*, *Chemistry*)

CURRENT RESEARCH AREAS

Principal Investigator, *Center for the Study of Life in the Universe, SETI Institute,* (1987 - present). Member of the NASA Kepler Mission Science Team, responsible for the detection of planets around eclipsing binary star systems.

UNIVERSITY TEACHING EXPERIENCE

Lecturer in Astrobiology, University of California, Santa Cruz (1998-2004)
*Astronomy and Astrophysic*s: Life in the Universe, Light and Optics.

PROFESSIONAL MEMBERSHIPS AND AWARDS

International Astronomical Union (Commissions 26, 42, and 51)
American Astronomical Society (Divisions for Planetary Sciences, History of Astronomy)
NASA Group Achievement Awards: Voyager Flight Operations (Photo and Image Processing), Search for Extraterrestrial Intelligence (High Resolution Microwave Survey Deployment), and Search for Extraterrestrial Intelligence (SETI Institute Science Education Project)

REFERENCES

Dr. Frank Drake, *President*, SETI Institute, 515 N. Whisman Road, Mountain View, CA 94043, tel. (650) 960-6633, fdrake@seti.org.

Dr. Sandy Faber, *Professor*, Astronomy and Astrophysics, University of California, Lick Observatory, Santa Cruz, CA 95064, tel. (831) 459-2844, faber@ucolick.org.

Dr. William Borucki, *Principle Investigator, NASA Kepler Mission*, 244-1, NASA Ames Research Center, Moffett Field, CA 94035, tel. (650) 604-6492, wborucki@gal.arc.nasa.gov.

BIBLIOGRAPHY

Eighty (80) papers in the refereed scientific literature. Selected references of papers relevant to this proposal below (a full bibliography can be supplied as needed.)

Doyle, L.R., 2009, "Quantification of Information in a One-Way Plant-to-Animal Communication System," *Entropy* **11**, 431-442.

Doyle, L.R., B. McCowan, S. F. Hanser, T. Bucci, C. Chyba, and J.E. Blue, 2008, "Applicability of Information Theory to the Quantification of Responses to Anthropogenic Noise by Southeast Alaskan Humpback Whales," *Entropy* **10**, 33-46.

McCowan, B., Doyle, L.R., Kaufman, A. B., Hanser, S. & Burgess, C., 2008, "Detection and Estimation of Complexity and Contextual Flexibility in Nonhuman Animal Communication," in *Evolution of Communicative Flexibility; Complexity, Creativity, and Adaptability in Human and Animal Communication*, (D.K. Oller and U. Griebel, eds), MIT Press, Cambridge, Massachusetts, pp. 281 – 303.

McCowan, B., L.R. Doyle, J.M. Jenkins, and S.F. Hanser, 2005, "The Appropriate Use of Zipf's Law in Animal Communication Studies," *Animal Behaviour* **69**, F1-F7.

Hanser, S.F., L.R. Doyle, B. McCowan, J.M. Jenkins, 2004, "Information Theory Applied to Animal Communcations Systems and Its Possible Application to SETI," in *Bioastronomy 2002: Life Among the Stars, IAU Symposium* **213**, R.P Norris and F.H. Stootman (eds), A.S.P., San Francisco, CA, 514-518.

McCowan, B., L.R. Doyle, and S. Hanser, 2002, "Using Information Theory to Assess the Diversity, Complexity, and Development of Communicative Repertoires," *J. Comparative Psychology* **116**, 166-172.

Hanser, S., B. McCowan, and L.R. Doyle, 2000, "Information Theory as a Comparitive Measure of Animal Communication Complexity," in *Bioastronomy '99: A New Era in Bioastronomy*, A.S.P. Conference Series vol. 213, Astronomical Society of the Pacific, San Francosco,G.A. Lemaechand and K. J. Meech, (eds), 613-617.

McCowan, B., S.F. Hanser, and L.R. Doyle, 1999, "A Quantitative Tool for Comparing Animal Communication Systems: Information Theory Applied to Bottlenose Dolphin Whistle Vocalizations," *Animal Behavoir*, **57**, 409-419.