
Adi Bulsara, Ph.D.



Senior Research Scientist for Nonlinear Dynamics Space and Naval Warfare Systems Command

Dr. Adi Bulsara was selected as a Senior Research Scientist for Nonlinear Dynamics at Space and Naval Warfare Systems Command (SPAWAR) Systems Center Pacific (SSC Pacific) in 2009. He is currently the principal mentor of the eleven-member Applied Data Research group, globally recognized as one of the premier groups for research in nonlinear dynamics.

Dr. Bulsara holds both a bachelor's of science and a master's of arts degree in physics, and he received his Ph.D. in physics in 1978 from the University of Texas at Austin. At Austin, he worked in the statistical mechanics group headed by Nobel Laureate, Ilya Prigogine. After earning his Ph.D., he was a Postdoctoral fellow at the University of California at San Diego. He began his civilian career at SSC Pacific in 1983, working as the only scientist in the field of nonlinear dynamics. With a specialization in the physics of nonlinear dynamical systems in the presence of noise, he was one of the early proponents of the Stochastic Resonance (SR) phenomenon.

In 1991, with collaborators Drs. Andre Longtin and Frank Moss, Dr. Bulsara was the first to propose SR as an underlying mechanism in the processing of information by sensory neurons in the presence of background noise. Their work led to a News and Views review in Nature entitled, "Towards the Brain's Computer Code?" by then-editor Sir John Maddox. Their remarkable predictions have since been validated in numerous biological preparations and psychological experiments involving perception and cognition. Following this work, Dr. Bulsara concentrated on the physics of noise-mediated cooperative phenomena, of which SR is just one example, in coupled arrays of nonlinear dynamic devices (e.g. neurons, superconducting quantum interference devices, and other nonlinear devices, including room temperature magnetometers). His work was featured in the cover article of Physics Today in March 1996, "Tuning to the Noise." This work has led to a compact, inexpensive, and very sensitive room temperature magnetometer that is being actively considered as an intrusion sensor by the Marine Corps today. In 1996, Dr. Bulsara was awarded SSC Pacific's Lauritsen-Bennett award for excellence in Science.

Dr. Bulsara was elected as a Fellow of the American Physical Society in 2004. He was cited for his work on Stochastic Resonance. Additionally, Dr. Bulsara spent the summers of 2004 through 2006 as a visiting science advisor to the Office of Naval Research (ONR)-Global in London. He worked at the forefront of research in diverse areas such as nano-devices, materials, and nonlinear physics. He developed three collaborations involving the University of Catania and the University of Perugia (both in Italy), and the Warwick University (UK), funded through the

ONR-Navy International Cooperative Program. Dr. Bulsara authored three summary reports providing an overview of important concepts in modern nonlinear systems theory, published on ONR's website as part of their technical database. By invitation in 2005, Dr. Bulsara published a News and Views article in Nature entitled, "No-Nuisance Noise."

Dr. Bulsara has eight patents awarded, five patents pending award, and some 150 publications, several of which are foundation papers. Additionally, he frequently reviews and serves as final publication authority of journal manuscripts and is often an invited speaker at international scientific meetings, seminars, and academic colloquia.