

## Five with UT Physics Ties are Breakthrough Award Laureates

November 16, 2015

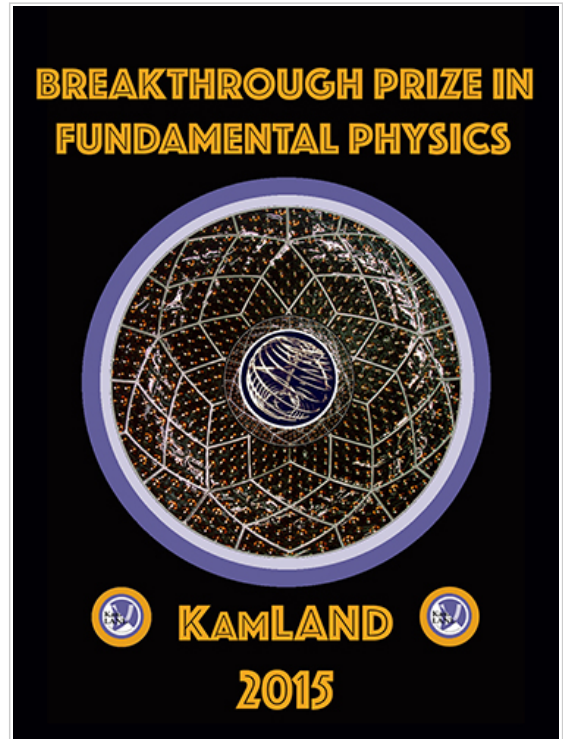
When UT's physicists got involved in neutrino physics by joining the KamLAND experiment in 1997, they weren't looking for financial gain. Yet with the experiment's selection for the Breakthrough Awards Fundamental Physics prize, their efforts will, quite literally, pay off. This is the third year for the awards, which honor achievements in Fundamental Physics, Life Sciences, and Mathematics. Collectively they distributed roughly \$22 million to scientists, mathematicians, and one high school student. The Fundamental Physics honor brings with it \$3 million in prize money, this year to be divided among five neutrino experiments and more than 1,300 physicists:

- Super-Kamioka Neutrino Detection Experiment in Japan
- Sudbury Neutrino Observatory in Ontario
- Daya Bay Reactor Neutrino Experiment in China
- **KamLAND Neutrino Detector in Toyama in Japan**
- KEK to Kamioka and Tokai to Kamioka Long Baseline Neutrino Oscillation Experiments in Japan

UT researchers listed among the KamLAND laureates are:

- Mikhail Batygov (Ph.D., 2006/UT Physics; now with Carleton University, Canada)
- William Bugg (Professor Emeritus)
- Yuri Efremenko (Professor)
- Yuri Kamyshev (Professor)
- Alexandre Kozlov (Former Postdoc at UT; now at Kavli IPMU in Japan)

The KamLAND (the Kamioka Liquid Scintillator Anti-Neutrino Detector) experiment began in 1997 and started taking data in 2002. The Physical Review Letters paper published in 2003, "First results from KamLAND: Evidence for reactor antineutrino disappearance," is the most highly-cited paper from the UT Physics Department and is one of the most highly-cited papers in the field of experimental particle physics. The collaboration announced the first detection of anti-neutrinos in 2005 and has shown that neutrinos can in fact change their "flavors" via neutrino oscillation. Future plans include a neutrino astrophysics program and the study of double Beta decay. Though Bugg has retired and Kamyshev is working with other experiments, Efremenko is still involved with KamLAND. All three are eligible for



the monetary reward accompanying the Breakthrough Award. Winners have until October 1, 2016, to claim their share of the prize, which will amount to roughly \$2,000 for each laureate in the Fundamental Physics category.

The Third Annual Breakthrough Awards were presented November 8 in an Oscar-style ceremony at the NASA Ames Research Center. The honors were founded in July 2012 by Russian tech investor Yuri Milner and are funded by the Brin Wojcicki Foundation; Mark Zuckerberg's fund at the Silicon Valley Community Foundation; the Jack Ma Foundation; and the Milner Global Foundation.

More information

- **Breakthrough Prize Website (<https://breakthroughprize.org/>) and list of 2016 Honorees (<https://breakthroughprize.org/News/29>)**
- **Breakthrough Prize KamLAND Collaboration Laureates (<https://breakthroughprize.org/Laureates/1/L154>)**
- **KamLAND website (<http://www.awa.tohoku.ac.jp/kamlande/>)**