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# 国台学术报告 NAOC COLLOQUIUM

## 2019 年 第 26 次 / No. 26 2019

**Time: Tuesday 2:30 PM, Nov. 12<sup>th</sup> Location: A601, NAOC**

## A Simple Model for AGN Quenching and Black Hole Scaling Laws

**Prof. Sandra M. Faber**

**University of California Santa Cruz**



Sandra Faber is University Professor Emerita at the University of California, Santa Cruz, and a staff member of the UCO/Lick Observatory. She is an observational astronomer with research interests in cosmology and galaxy formation. Some of her major discoveries include the first structural scaling law for galaxies (called the Faber-Jackson law), large-scale flow perturbations in the expansion of the Universe caused by superclusters of galaxies, and black holes at the centers of galaxies. In 1984, she and three colleagues presented the first detailed treatment of galaxy formation based on “cold dark matter”, which became the standard paradigm for galaxy and cluster formation in the Universe. Faber received her BA degree in Physics from Swarthmore College and her PhD in Astronomy from Harvard. She is a member of the U.S. National Academy of Sciences, the American Academy of Arts and Sciences, and the American Philosophical Society and is a Fellow of the Royal Astronomical Society. She serves on the boards of several

organizations including the Carnegie Institution of Science, Annual Reviews, and (formerly) the Harvard Board of Overseers. She has received the Heinemann Prize of the American Astronomical Society, the Antoinette de Vaucouleurs Medal of the University of Texas, the Centennial Medal of the Graduate School of Arts and Sciences of Harvard University, and five honorary degrees from American colleges and universities. In 2009, Faber was awarded the Bower Award and Prize for Achievement in Science from the Franklin Institute in Philadelphia, and in 2012 she received the Bruce Medal of the Astronomical Society of the Pacific and the Russell Prize of the American Astronomical Society, both for lifetime scientific achievement. She received the National Medal of Science from President Obama in February 2013. In November 2017, she received the Gruber Cosmology Prize from the Gruber Foundation.

### Abstract

Prof. Sandra Faber will describe a simple model for how galaxies move through the space of structural parameters and then encounter a boundary and finally quench. An important ingredient in the model is the rule for how galaxies build black holes during the star-forming phase and in the green valley. Recent data suggest that >90% of BH growth takes place in the green valley. This implies that there is no universal BH scaling law that covers both star-forming and quenched galaxies based on structural variables alone. However, we find it possible to construct a universal BH scaling law that unites all galaxies if star-formation rate is added to structure. This and other implications of the model will be discussed.

*All are welcome ; Tea and coffee will be served at 2:15 PM.*