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## NITheP Colloquium Monday, 25 January 2021

Prof Sera Markoff | University of Amsterdam

### "Putting the hair on black holes"



The physicist John Wheeler once famously said "black holes have no hair", meaning that a black hole can be characterised by a few numbers like its mass, spin and (not relevant for astrophysical black holes) charge.

However black holes end up having pretty complex "hair" when they gravitationally capture material in a process called accretion, and channel that energy into other forms that can drastically affect their environments. On the astrophysics side we are quite keenly interested in understanding the consequences of black holes, but we are still missing a predictive model for this energy conversion process.

Within this context, the Event Horizon Telescope (EHT) Collaboration's first direct image of a supermassive black hole is a game changer, offering our first glimpse of the regions just outside the event horizon. I will give a brief overview of the 2017 EHT results, with an emphasis on the astrophysical interpretation, and how our uncertainties there affect our ability to test deviations from general relativity. I will present some of the major outstanding questions, and give examples of the current cutting edge in modelling and interpretation, as well as an outlook to the challenges of the coming years.

#### BIOGRAPHY

Sera Markoff works at the interface of astrophysics and astroparticle physics, with a focus on compact objects and particle acceleration in their jets. After completing her PhD in 2000 at the University of Arizona, she was a Humboldt Research Fellow at the Max Planck Institute for Radio Astronomy in Germany, and a (US) National Science Foundation Astronomy & Astrophysics Postdoctoral Fellow at MIT. In 2006 she joined the faculty of the University of Amsterdam, where she is now full professor and also helped set up the Gravitation and Astroparticle Physics Amsterdam (GRAPPA) Centre of Excellence. She has won numerous awards for her research, and in 2014 was named a Fellow of the American Physical Society. She has also won awards for her outreach projects, most recently the Dutch Research Council (NWO) Diversity Initiatives in Domain Exact Sciences award. She is a member of the Event Horizon Telescope Collaboration, currently Vice-Chair of its Science Council, and is also a member of the Cherenkov Telescope Array (CTA) project.

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