

## **A Superconducting Journey to a Black Hole and Beyond**

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***Abstract*** – Until recently, the evidence for black holes had only been obtained indirectly; however, a large black hole consisting of 6.5 billion solar masses and residing 55 million light years away has now been imaged using superconducting detectors. This was a remarkable and common-culture captivating discovery requiring an “integrated telescope” collecting measurements from many radio astronomy observatories and an international cast of collaborating scientists and engineers.

This [DISCOVERY](#) could not have been accomplished without the Superconducting-Insulating-Superconducting (SIS) detectors at the heart of every receiver that greeted each photon after its long journey through the heavens. Four of the observatories, and almost all of the 230 GHz detectors involved in this discovery, used SIS mixer chips collaboratively developed by the University of Virginia Microfabrication Laboratories and the National Radio Astronomy Observatory’s Central Development Laboratory.

***Keywords (Index Terms)*** – Superconducting-Insulating-Superconducting (SIS) detectors, integrated telescope, SIS mixer chips.

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