Giovanni Fazio
and the Early Years of Ground Based
Infrared Astronomy

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Symposium in Honor of Giovanni Fazio
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Outline of Material

• The Early Years at SAO and meeting Giovanni

• The SAO Photometer

• The Galactic Center and the Influence of Giovanni

• Summary
The Early Years of IR Astronomy at SAO/Harvard Observatory

• In July 1969, I came to SAO to start an IR program with Bob Noyes.

• We built a Ground Based Infrared Photometer much like the one we had at Caltech.

• Once a week we would have lunch with Jim Wright, Giovanni, and his group.

• Giovanni would tell us about Gamma Ray Astronomy.

• We would tell him how easy it was to make discoveries in the IR.
The SAO Photometer

• With Giovanni’s encouragement, Bob Noyes and I finished the Photometer in the spring of 70 and a young undergraduate, Steve Willner, used it at Kitt Peak to make measurements of Planetary Nebula.

• I left SAO in 1970 and went back to Caltech and Doug Kleinmann took my SAO position.

• Doug upgraded the photometer and with graduate student, Ned Wright, used it to discover a IR point source in M-17.

• Further upgrades by Frogel, Persson and Aaronson with a InSb detector allowed the first systematic near IR observations of External Galaxies, including the CO band.
In late Spring of 1970 I went back to Mount Wilson to look for variations in the 2.2 micron radiation from the Galactic Center.

This suggestion came from Giovanni through his high energy work on the Crab Nebula and other sources.

Giovanni was correct, but we were off by a factor of 10,000.
The Galactic Center: 1967-1994

I. Gatley/NOAO/KPNO, (inset) G. Neugebauer & E. E. Becklin/Caltech
We Needed to Know Where to Look

• There was a lot of stellar background and we needed to know where to look.

• This took much development with large sensitive detector arrays, large telescopes, and Adaptive Optics.

• Giovanni and his collaborators Pipher and Forrest, produced the InSb array detectors that made it possible.

• Genzel etal and Ghez etal determined where to look.
Adaptive Optics Really Made a Difference

- Once the position of the Black Hole was determined, it was possible to look for variations

- This was done by both Genzel et al (VLT) and Ghez et al (Keck) using Advanced Adaptive Optics
There are Still Questions to be Asked

• What are the nature of the variations?
• Are there correlations with X-rays and Radio?
• Is there a Gamma Ray Source?
• Will there be a big outburst in the future?
Variability of Sgr A* in IR and X-ray

Hornstein et al, GC06 Conference Proceedings, 2006
Giovanni Fazio has Made a Big Difference in Ground Based Infrared Astronomy

• Support of the developing Students, Post Docs and Staff

• Development of Large Format IR Detectors

• Thank You!!