

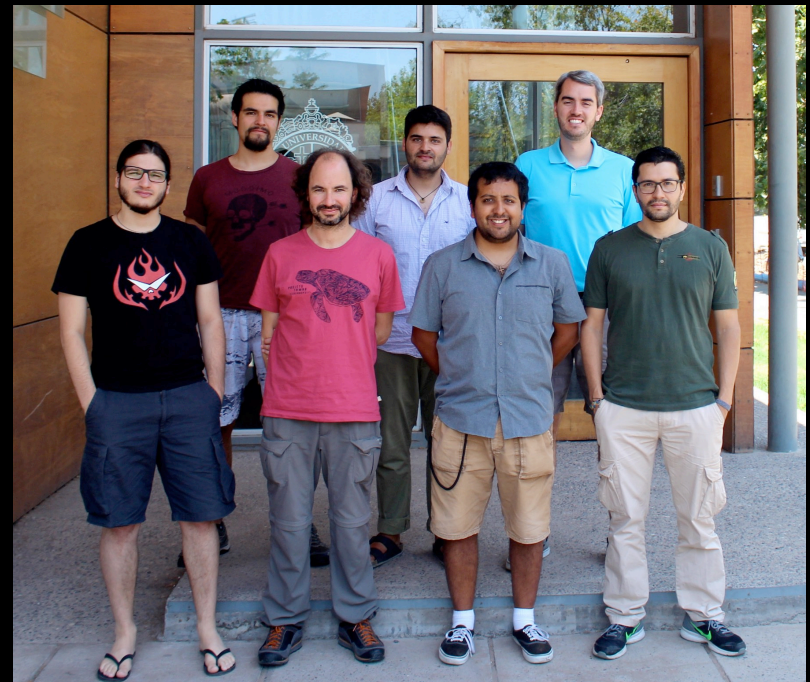
Joint Examination of the Galactic Heart via Computer Simulations & Multiwavelength Observations

A massive black hole
of $4 \times 10^6 M_{\odot}$

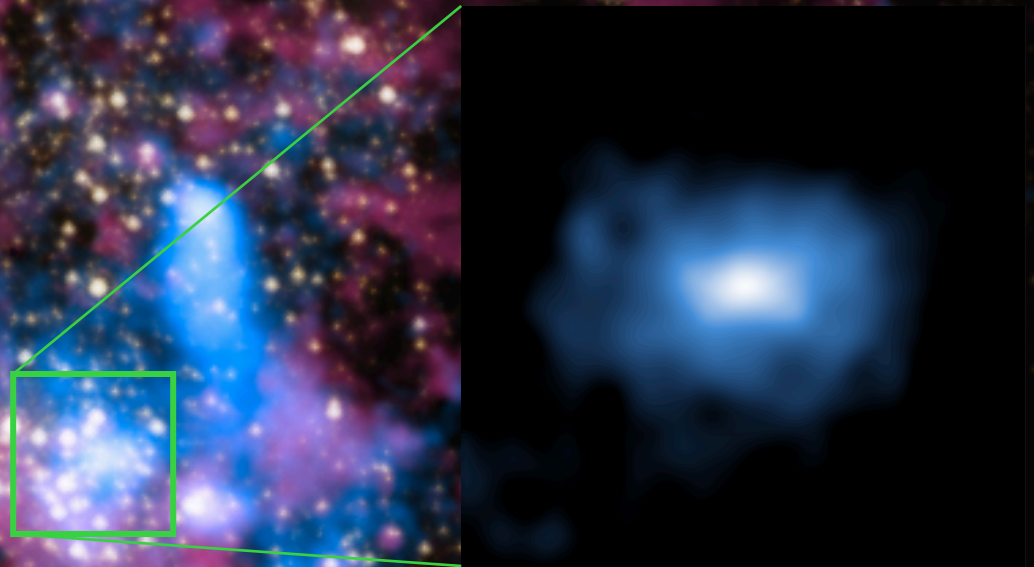
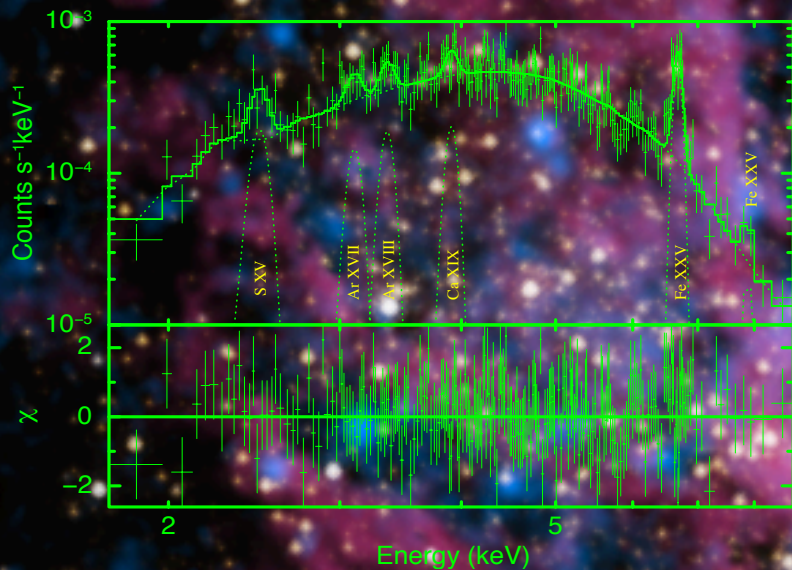
Q. Daniel Wang
University of Massachusetts &
Pontificia Universidad Católica de Chile



Prof. Jorge Cuadra's research group in the Institute of Astrophysics at PUC

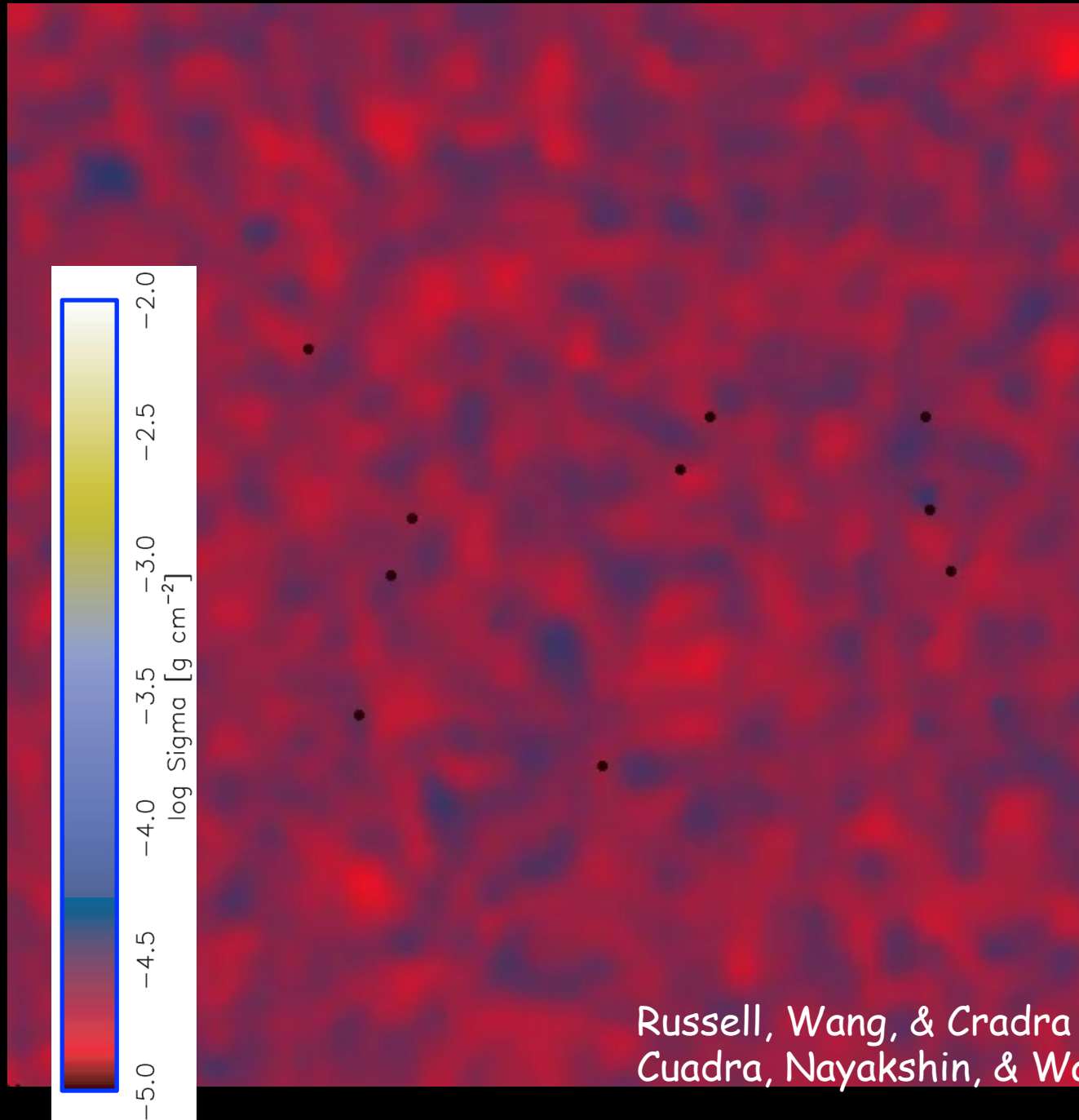


Near-infrared and X-ray view of our Galactic center



> 99% of the initially captured mass gets ejected in the accretion process of the central black hole and can potentially strongly impact the environment.

Wang et al. (2013, Science)



Russell, Wang, & Cradra (2017)
Cuadra, Nayakshin, & Wang (2015)

Complex interplay between the central black hole and its environment

Red: dust FIR emission (Spitzer)
Yellow: ionized gas Pa- α emission (Hubble)
Blue: X-ray (Chandra)

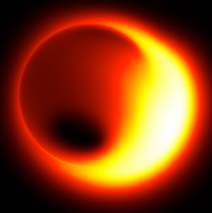


Wang et al. (2010)

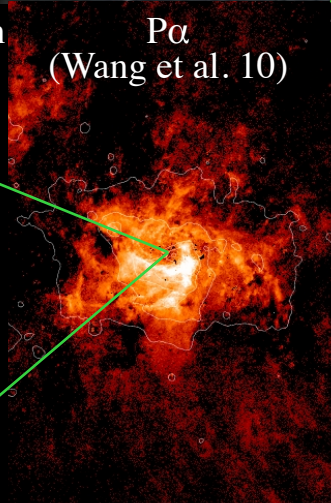
Galactic center as a laboratory



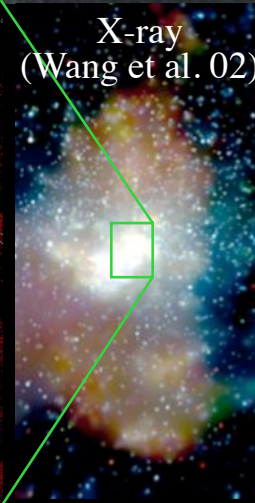
MM simulation
(Broderick)



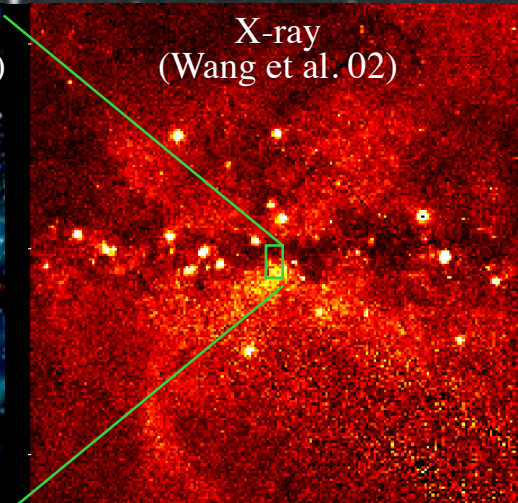
P α
(Wang et al. 10)



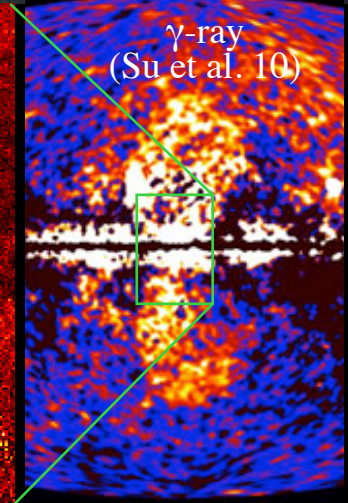
X-ray
(Wang et al. 02)



X-ray
(Wang et al. 02)



γ -ray
(Su et al. 10)

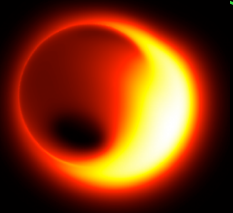


Key questions to answer

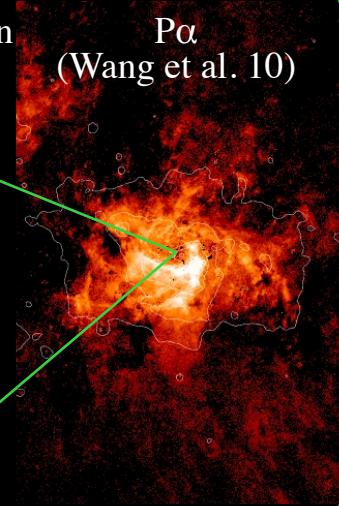
- Can the simulation reproduce the observed structures and their energetics?
- How do they regulate the Galactic ecosystem?
- What might be the life-cycle of the central activity?

We can observe structures on a 10^{10} range of scales!

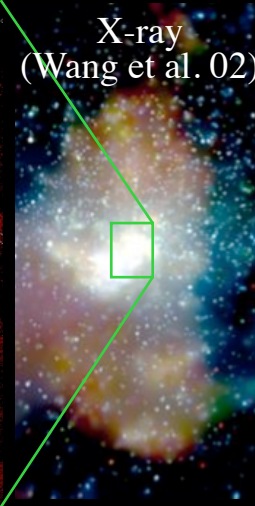
MM simulation
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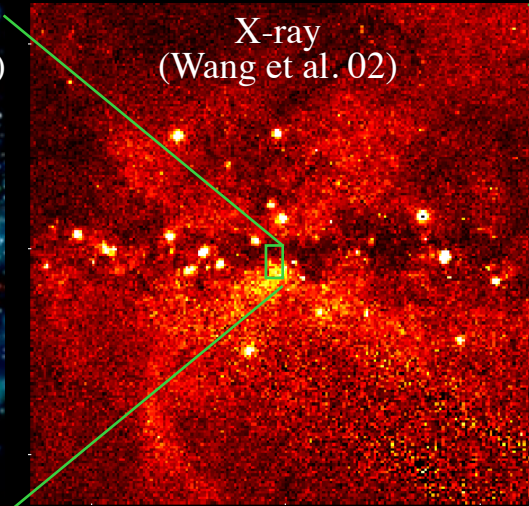
P α
(Wang et al. 10)



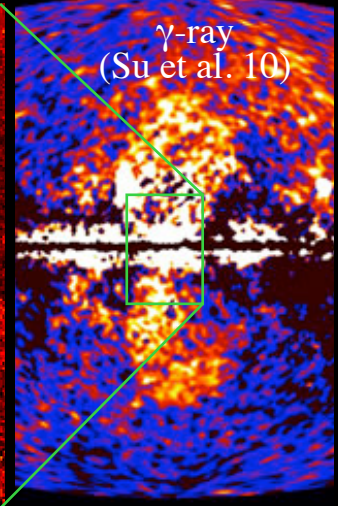
X-ray
(Wang et al. 02)



X-ray
(Wang et al. 02)



γ -ray
(Su et al. 10)



What I intend to do in Chile:

- Strengthen our existing collaboration on the study of the Galactic center.
- Develop new research collaborations.
- Train a new generation of scholars in the research field.
- Outreach to wider communities and enjoy the culture and natural diversities of this country.

Thanks

Gracias al programa internacional de
redes académicas de la Pontificia
Universidad Católica y al programa
Fulbright de los Estados Unidos



