The turbulent environment of Sgr A*

Star formation in the turbulent radiation field of a supermassive black hole?















AO, K-band, NACO, 2011

DePoy 1991



AO, K-band, NACO, 2011

07.06.2022

- Organized structur of the S-cluster
- Young age of the S-cluster members
- Connecting process?
- Tracer?

- Organized structur of the S-cluster: Check
- Young age of the S-cluster members
- Connecting process?
- Tracer?



Ali et al. (2020)

- Organized structur of the S-cluster: Check
- Young age of the S-cluster members: Check
- Connecting process?
- Tracer?



Ghez et al. (2003), Habibi et al. (2017)

- Organized structur of the S-cluster: Check
- Young age of the S-cluster members: Check
- Connecting process? Check
- Tracer?



Jalali et al. (2014)

- Organized structur of the S-cluster: Check
- Young age of the S-cluster members: Check
- Connecting process? Check
- Tracer? Let's talk about it



Peißker+2019, Peißker+2020b, Peißker+2021a, c

The Galactic center cloud G2, a unique case study



The Galactic center cloud G2, a unique case study



Gillessen et al. (2012)

The Galactic center cloud G2, a unique case study



Peißker et al. (2021c)

07.06.2022

Gillessen et al. (2012)

There is no "head"



This is the "tail"

Position-velocity diagram



Position-position-velocity diagram





Maybe -> Data implies

But: Projection, Temporarily

But but:

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But but:



Maybe -> Data implies

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But but:

More data/objects (like, e.g., G1 & X8) needed



Maybe -> Data implies

But: Projection, Temporarily

But but:

More data/objects (like, e.g., G1 & X8) needed



Most stars formed in mulitplet systems (see ,e.g., Sana+2012)

For GC -> Stephan et al. (2016) -> about 70% 6-7 Myrs ago

From Cirulo+2020/Peißker+2021c -> 7% nowadays using dusty objects

Keep this numbers in mind:

70% around 6 Myr ago 7% after 6 Myr



Cluster analysis

Not yet published

- Same distance
- Different age
- RCW 108: 1 Myr
- Hourglass/DBS 121: 1.5 MyrDBS 113: 2.8 Myr

Cluster analysis

Not yet published

- Binary fraction
- Triplet fraction
- Companion fraction
- Sort by age

Cluster dynamics

Not yet published

Connecting cluster dynamics

Not yet published

This only accounts for the S-cluster!

Age estimate from Habibi+2017

Not yet published

Not yet published

Not yet published

Not yet published

- Key features of this analysis:
- 7 NIR/MIR instruments
- Ground/space based
- Radio (ALMA)
- Data baseline about 24 years
- Spectral analysis 1.5-4.5 μm
- Most likely a high-mass YSO
- Herbig Ae/Be class?

Not yet published

Final remarks

- GC region is a unique laboratory
- The more we search, the more we find
- Many undiscovered sources
- IFU data from JWST will continue the journey
- More tracers? For sure...