Progress report

Two-dimensional simulation of supermassive star formation

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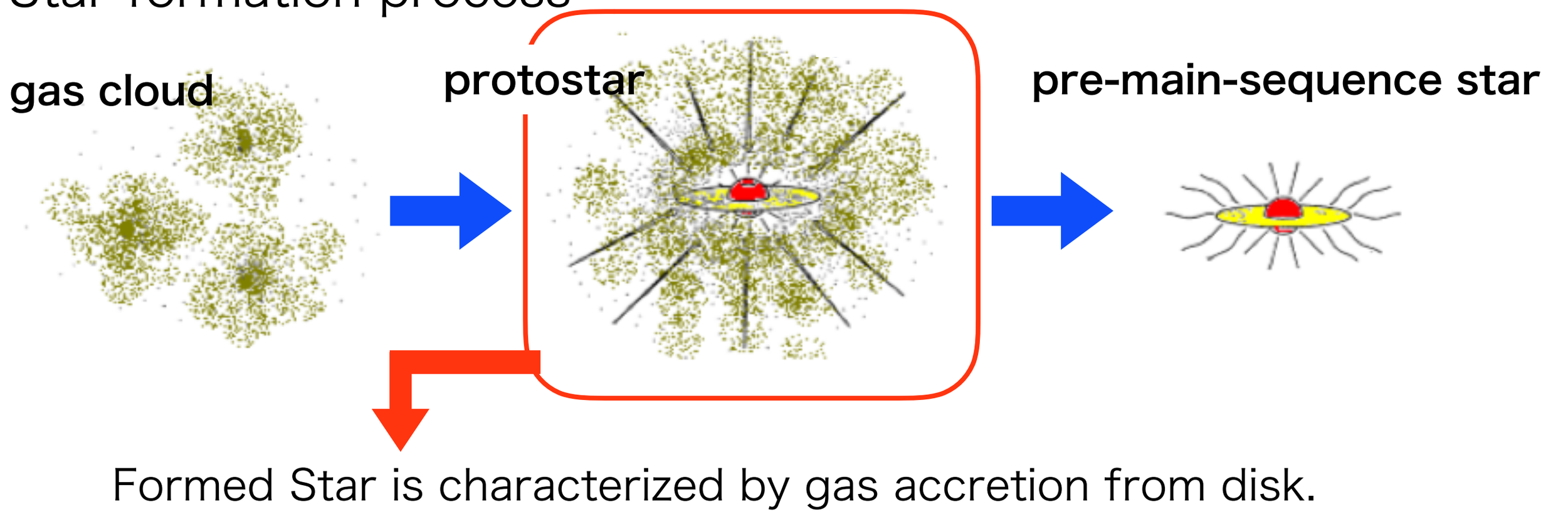
Background of My Study

Star formation process

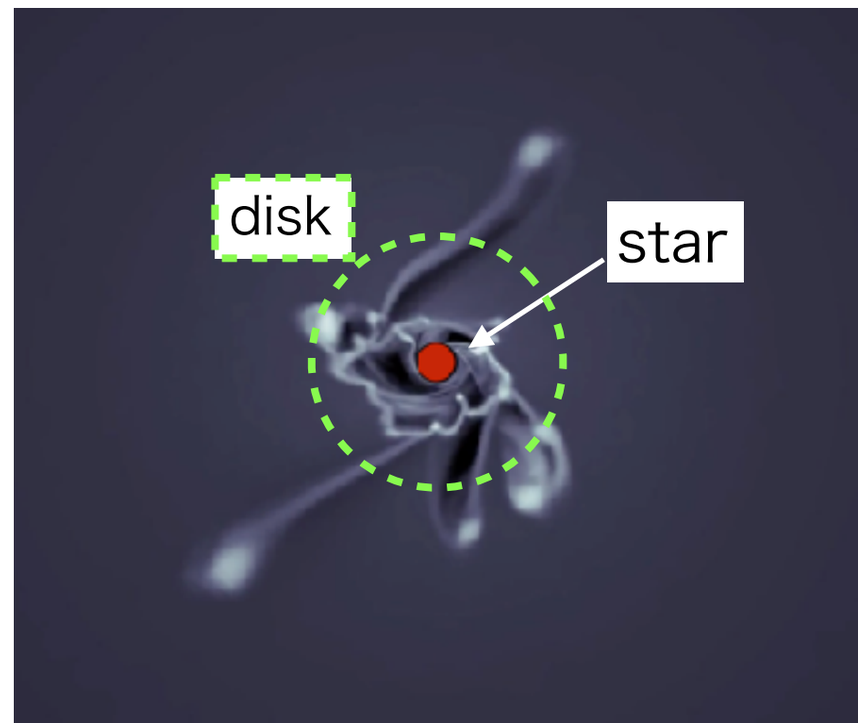


Formed Star is characterized by gas accretion from disk.

high or low mass star?, single or multiple stellar system?

We follow the time evolution of circum-stellar disk using numerical simulation.

- ✔ **origin of supermassive black holes**
- ✔ **initial mass of star**
- ✔ **multiple stellar system formation**



Plan of my study

zero-metal star formation

supermassive star formation

What is the origin of supermassive black holes?

low-metal star formation

metallicity dependence of gravitational instability of the disk

- stellar mass
- stellar multiplicity

solar-metal star formation

thermal evolution of the disk around sun-like star

(This topic mainly is studied by a collaborator.)

metallicity ≈ cosmic time

Supermassive Star Formation

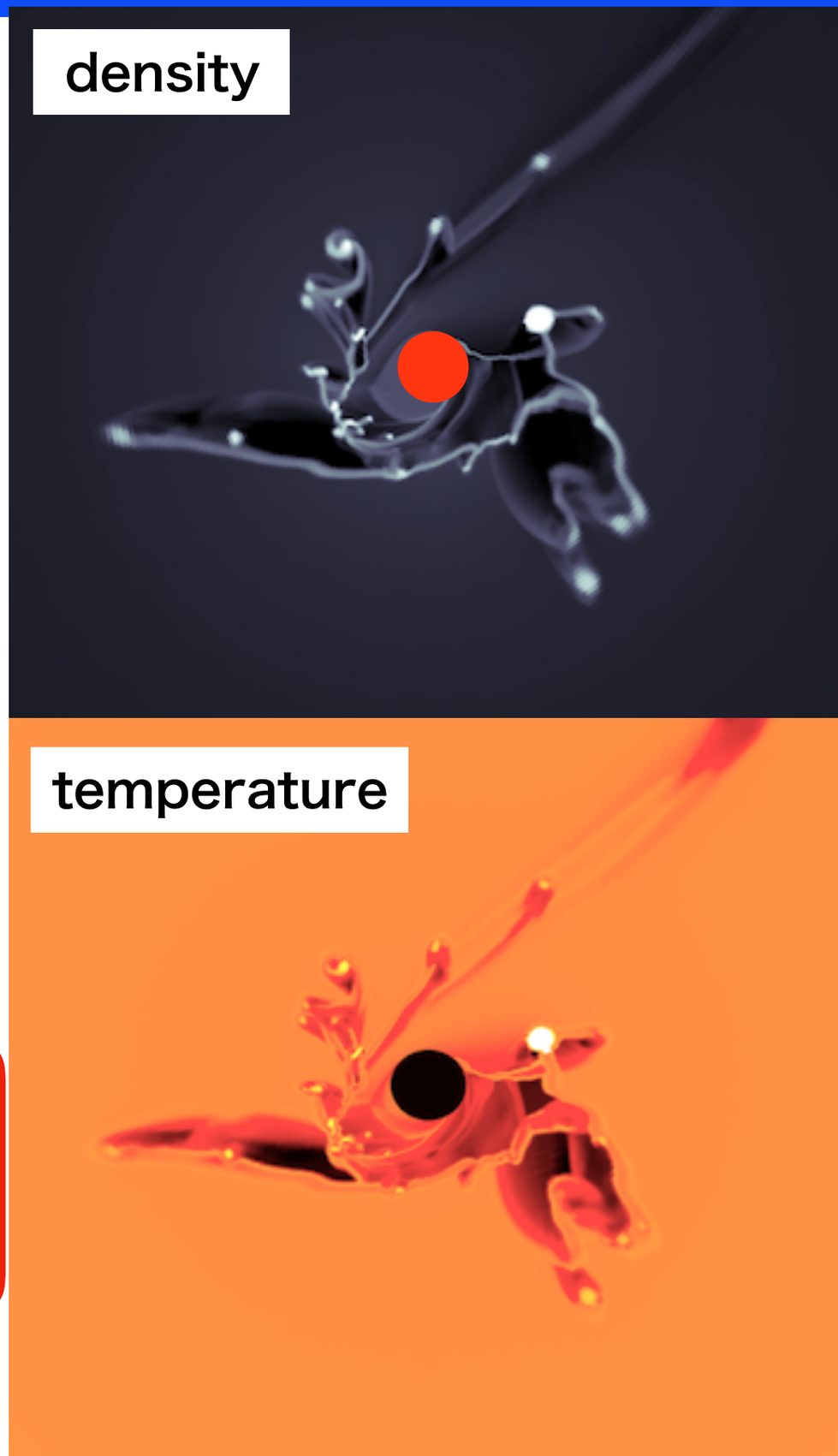
We follow the time evolution of
primordial gas cloud.

✔ Gravitationally unstable disk is formed.
spiral arm
gas clumps

✔ accretion rate : $\sim 0.1\ \mathrm{M}_\odot\ \mathrm{yr}^{-1}$

✔ Central stellar mass reaches $\sim 10^4\ \mathrm{M}_\odot$.

Now, I am writing the paper summarizing
the numerical simulation results.



Course status

- Advanced Lecture on Physics for the Universe I

  GSP: 7p + GASP: 3p → **total: 10p**

- Advanced Experiments on Physics for the Universe

  GEP 8P (remaining points: 5p)

  N2: Scintillator hodoscope array read by MPPC

  A1: Measurements on optical aberrations in an optical observation system

- Overseas training

  I went to Austria for two weeks this summer.

  plan

  Austria : visit the collaborator

  Italy : speak at the seminar

  Chile : participate in the conference, First Stars VI