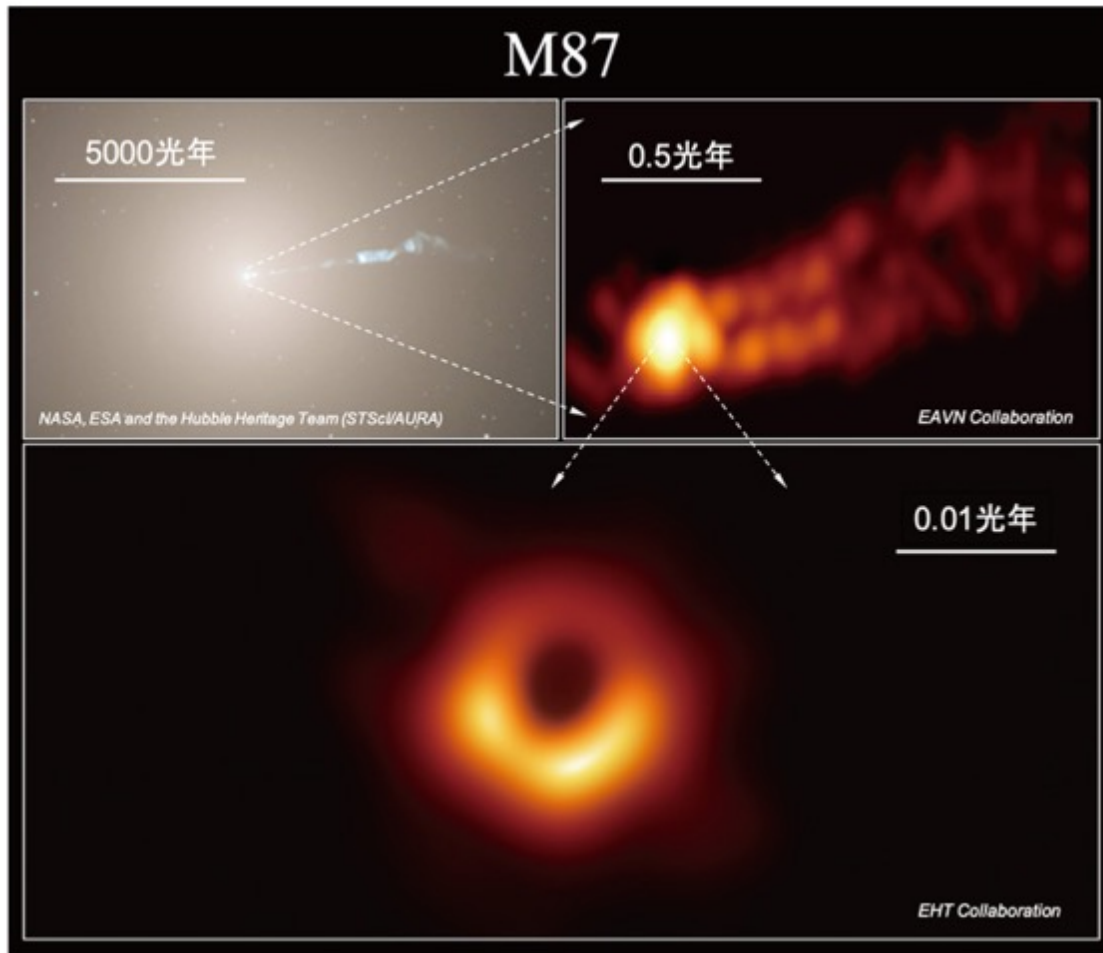


# Plasma Astrophysics

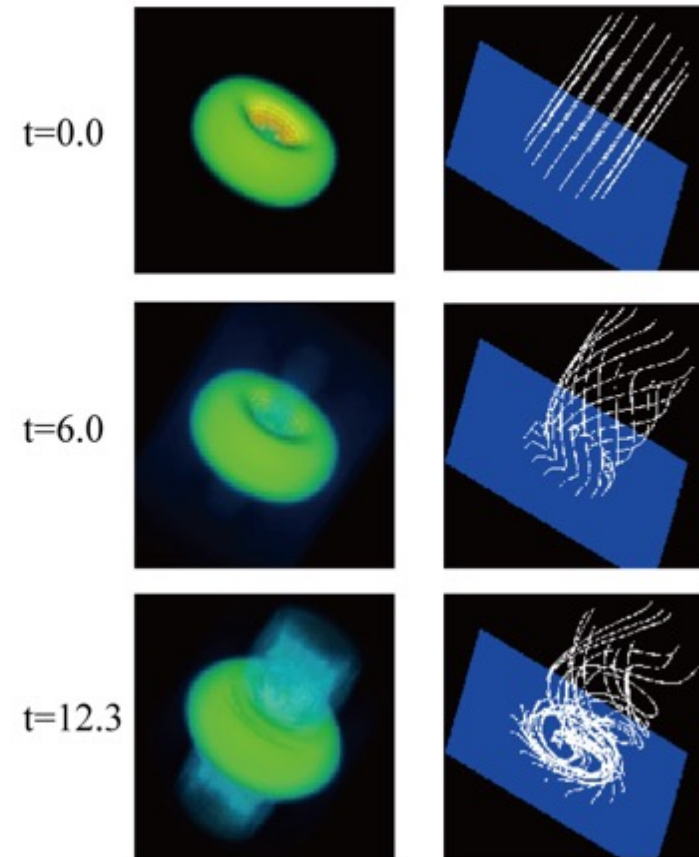
Toshiki Tajima, UCI

Class 10:PHY249 (2020Spring)



Event Horizon Telescope (2020)

3D Structure of Disk and Jet



Tajima Shibata (1997) p. 387



**With respect and  
sympathies  
#ActForInclusion**

# Presentations by 5 pairs

- 2~ 3 pages of description of your particular astrophysical object based on your bullets last week:
  - possibilities of localized UHECRs from  
Blazars, Cen A, M82, NGC253, SS433  
and their singular properties in relation to  
wakefield acceleration
- Along with it, your slides for each of the 5 cases.

# Our teams

<b>Assigned Example</b>					
	Greg	Wenhao	Gabe	Michael	Noor
Blazar	<b>X</b>	<b>X</b>			
M82			<b>X</b>	<b>X</b>	
Cen A	<b>X</b>				<b>X</b>
NGC 0253				<b>X</b>	<b>X</b>
SS 433		<b>X</b>	<b>X</b>		

# Plasma Astrophysics (Tajima, 2020)

- Class 10: Checking the observations and interpretations / predictions

- -Do we have (or will have) localized UHECRs? ←  
-What properties do they have? ←

such as

high energies? (such as  $\sim$  or  $> 10^{19}$  eV?)

spatial localization?

time structures?

accompaniment of other waves ( $\gamma$ , X, radio, light)?

cosmic rays other than protons (such as neutrinos)?

-Are they explainable by the new theory?

- Are there some concerns or questions?

Are facts doubled checked?

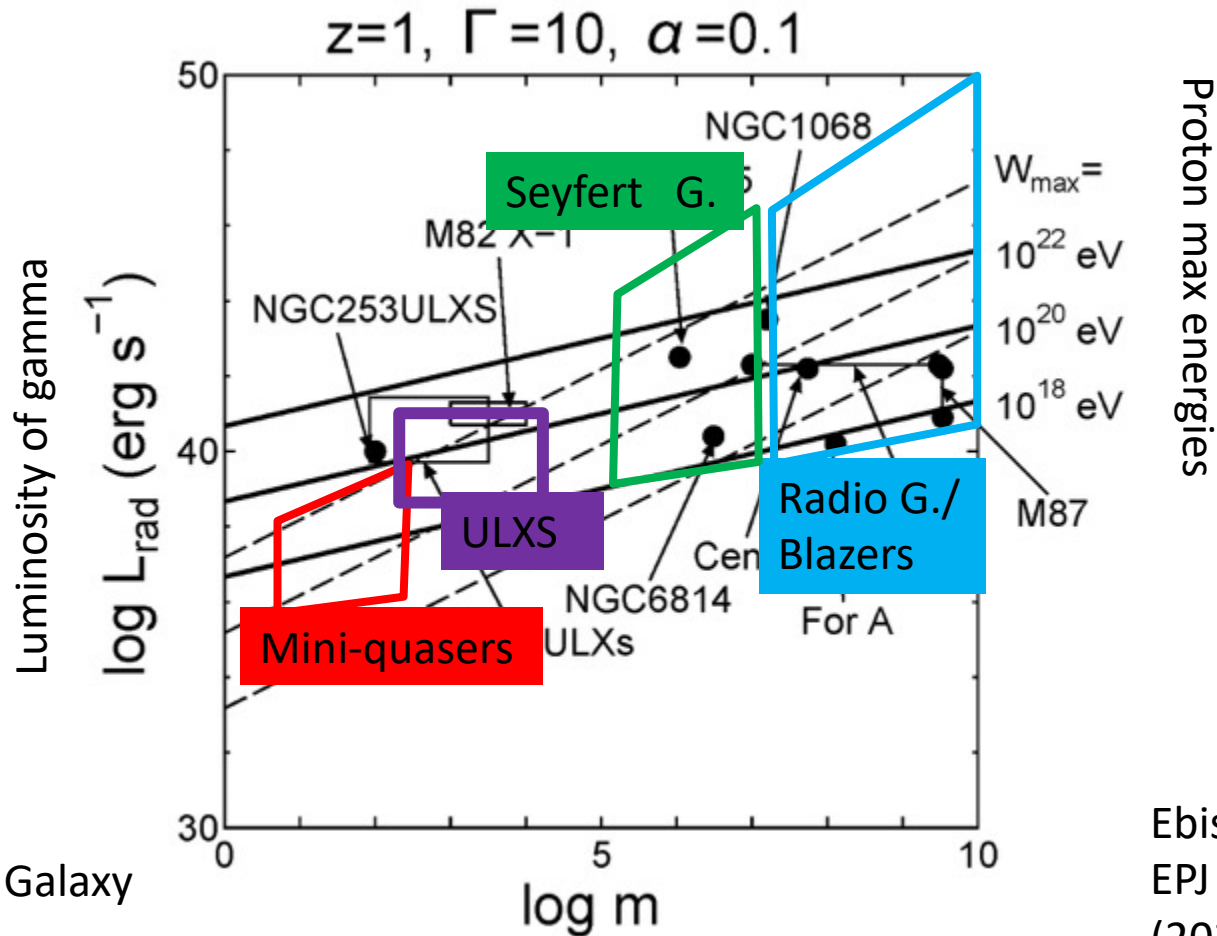
Can we write a **short report** on **each** astrophysical object?

# Preparatory writing on the possibilities of Localized UHECRs and associated phenomena related to wakefields

Each object name (and the team names):

- Category of the astrophysical object
- Chief characteristics of observed phenomena (or emissions)
- Typical energy or other numbers (such as gammas, radio,...)
- Observed (or lack of) localized UHECRs
- Other detailed characteristics, such as the time structures, coincidence (or lack) of other observations
- Other comments, reservations, special significances, etc.

# cosmic ray acceleration and gamma-ray emission



Miniquasars:  
can be in our Galaxy

Ebisuzaki, Tajima  
EPJ **223**, 1113(2014);  
(2020)

BH Astronomy with Ultra High Energy CRs

# Thursday: Putting together

- 5 Sections on 5 objects  
(A. Blazar; B. Cen A; C. M82; D. NGC 253; E. SS433)  
2~3 pages of description  
and slides
- Introductory Section
- Summary Section

Final submission: Sunday 5pm