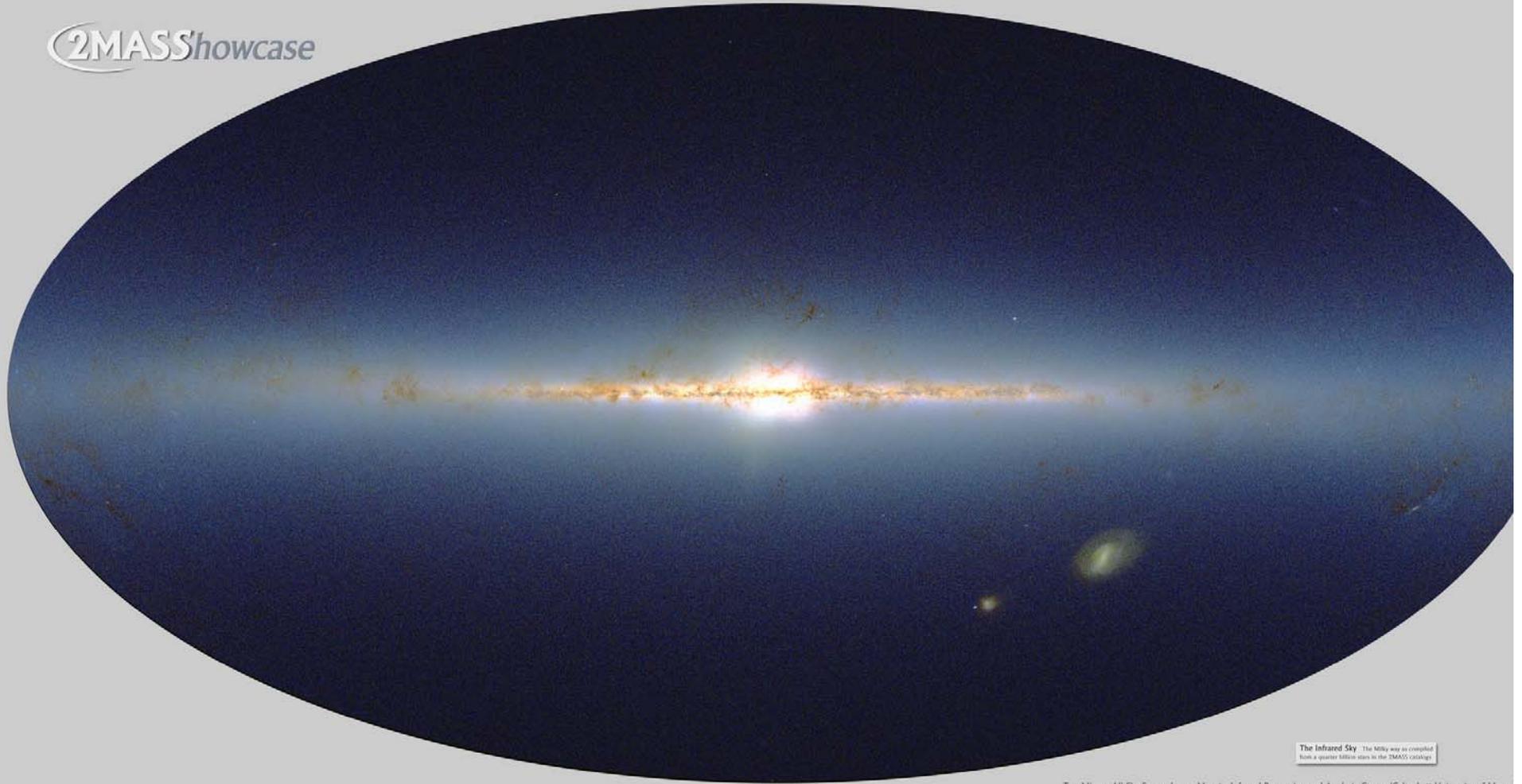


СТАЛКИВАЮЩИЕСЯ ГАЛАКТИКИ

(ПРОБЛЕМЫ РЕШЕННЫЕ И
НЕРЕШЕННЫЕ)

Наша Галактика (2MASS)

2MASS Showcase



The Infrared Sky - The Milky way as compiled from a quarter billion stars in the 2MASS catalog

Two Micron All Sky Survey Image Mosaic: Infrared Processing and Analysis Center/Caltech & University of Massachusetts Lowell



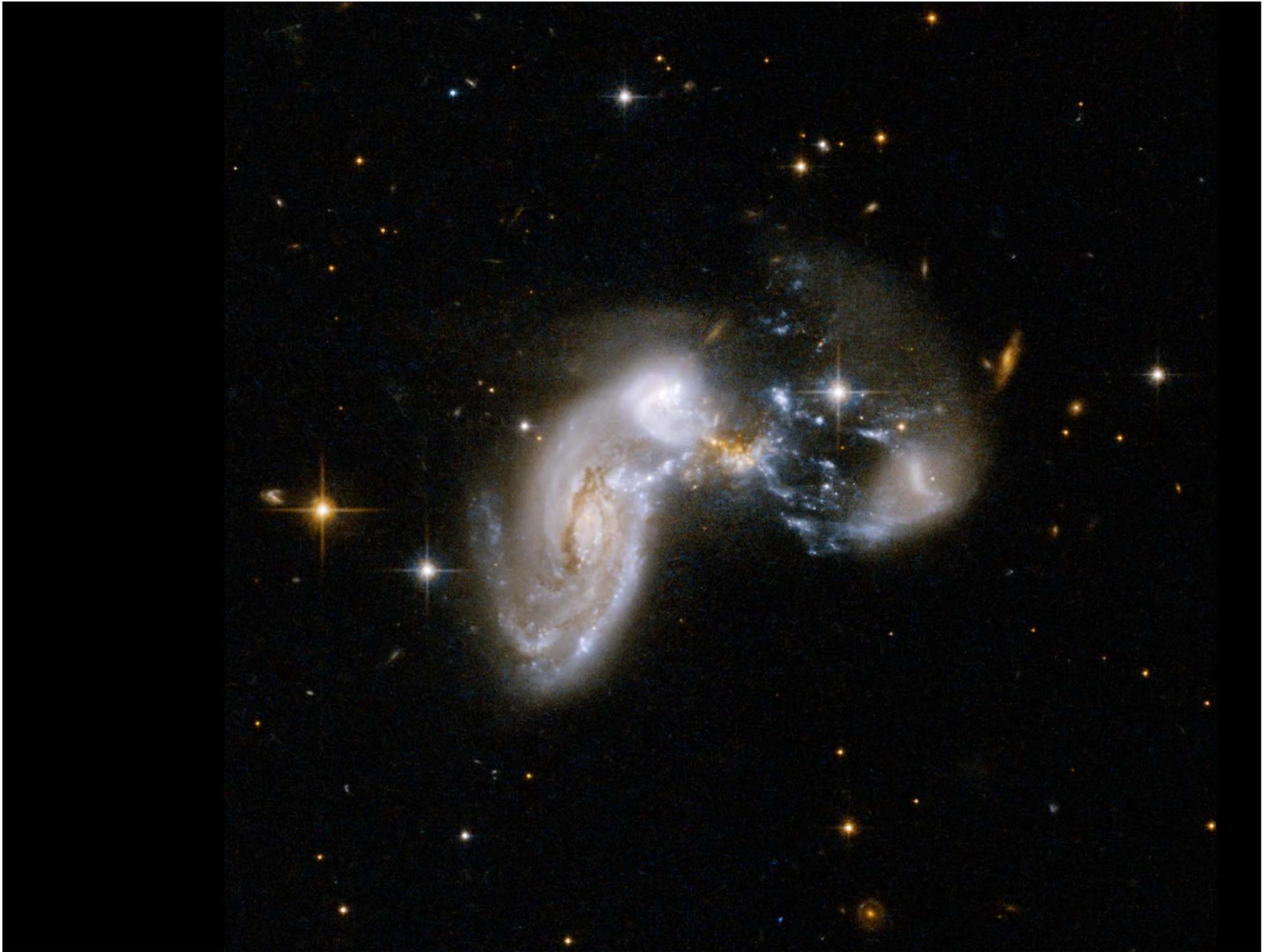
Столкновение нашей
Галактики с Туманностью
Андромеды
НЕИЗБЕЖНО!

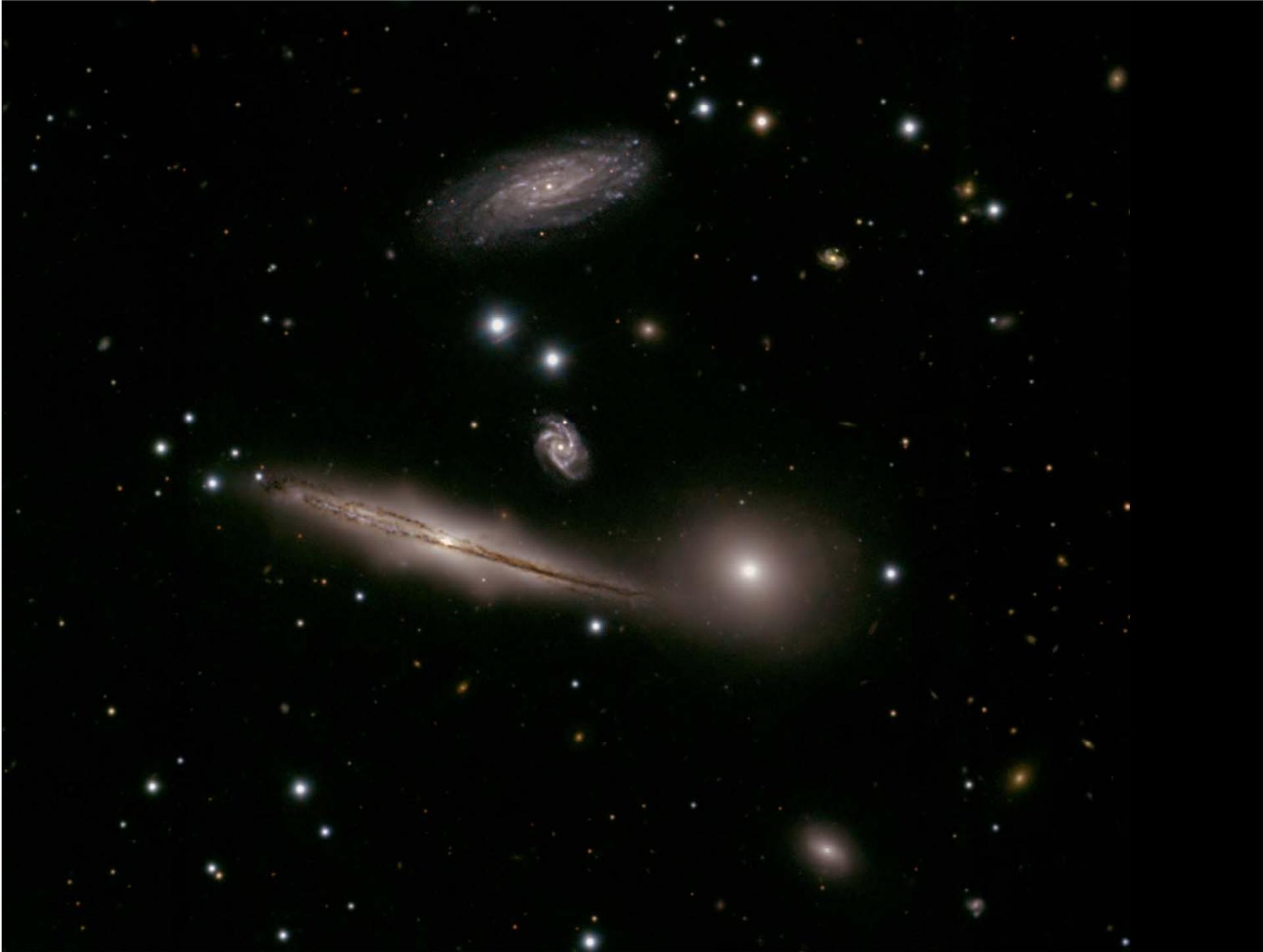
Наблюдаемая лучевая скорость М31: - 297 км/с

Скорости сближения центров масс: 120 км/с



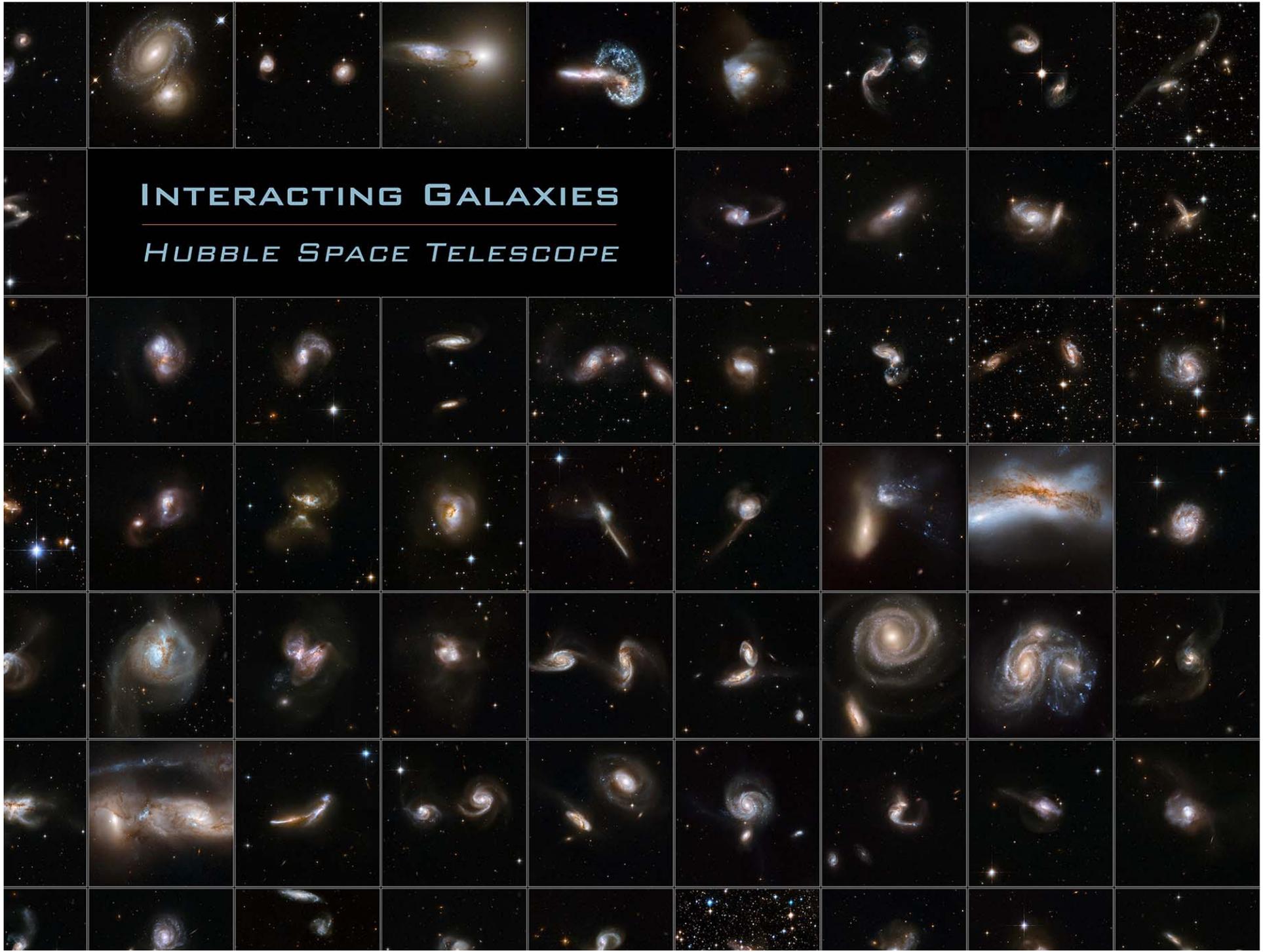
ВЖАЄ!
ГАЛАКТИКИ
НЕИЗБЕЖНО
СТОЛКНУТЯСЯ!!!







INTERACTING GALAXIES
HUBBLE SPACE TELESCOPE







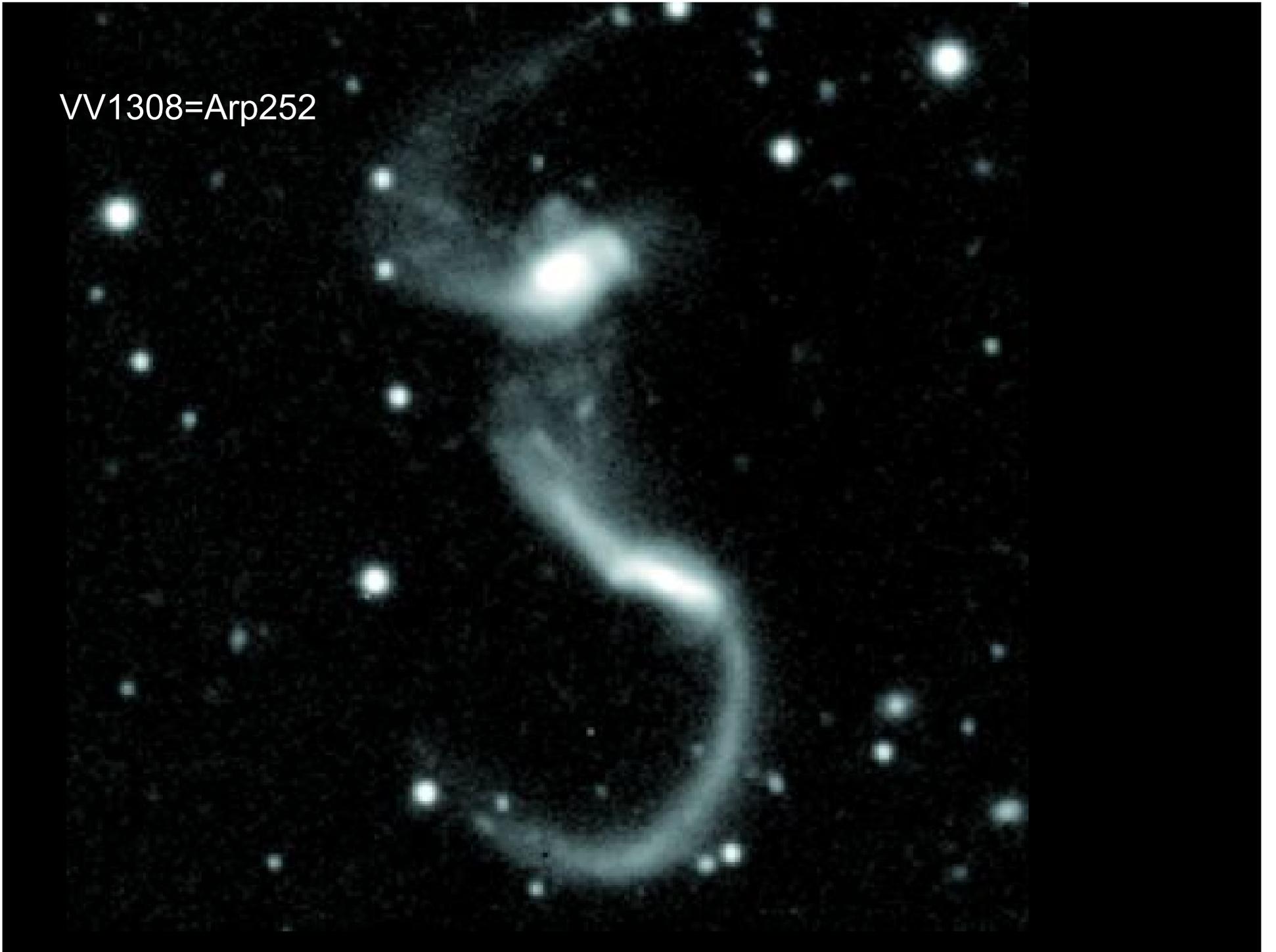


Galaxy NGC 2787

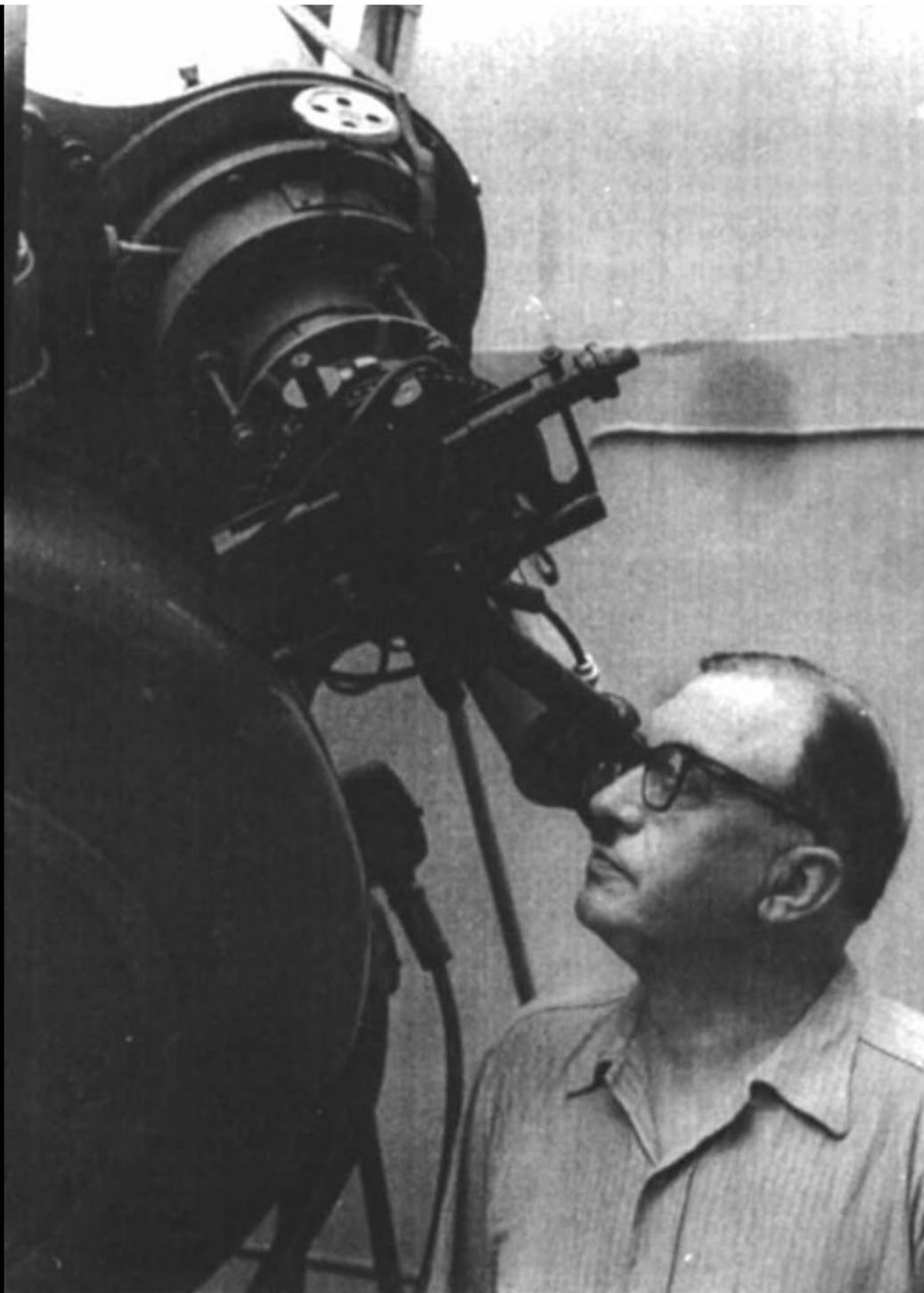


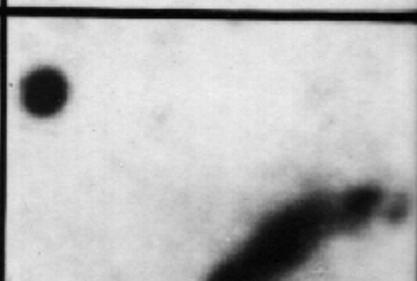
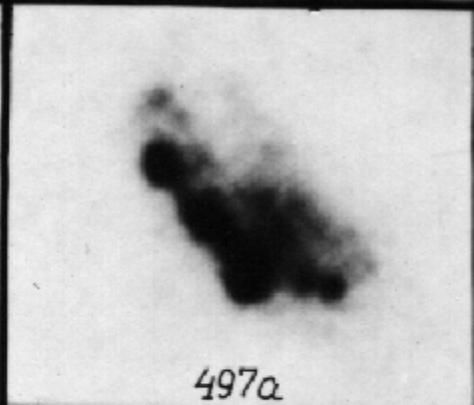
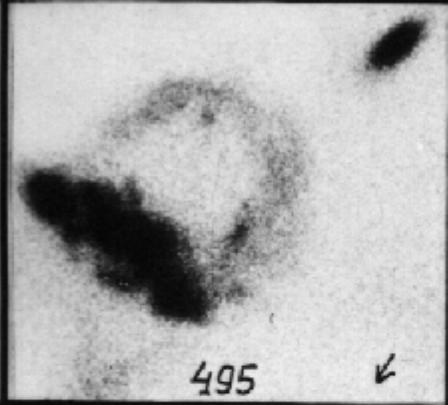
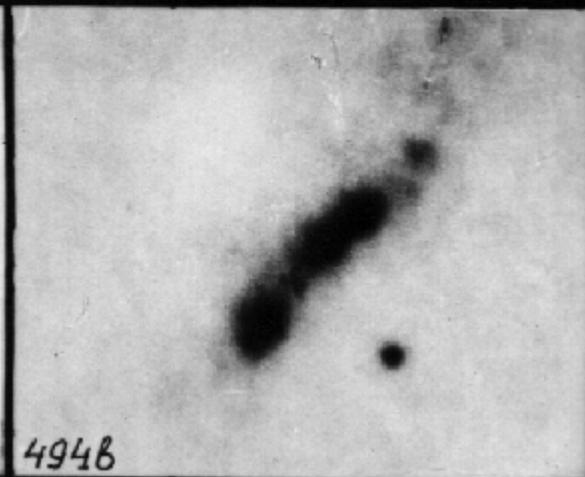
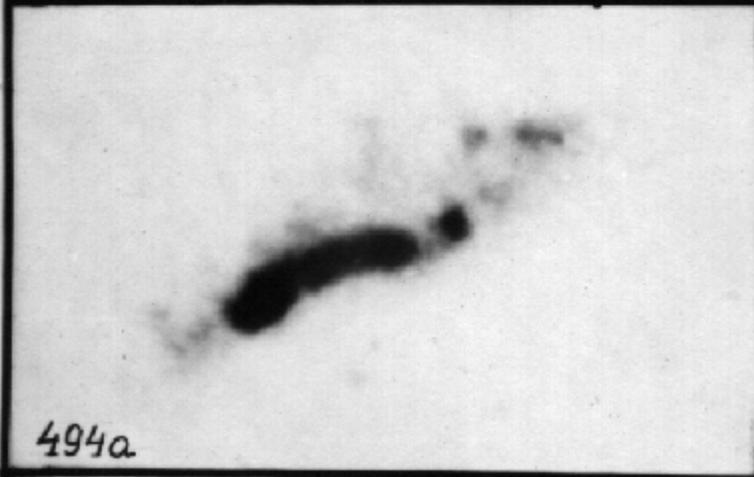
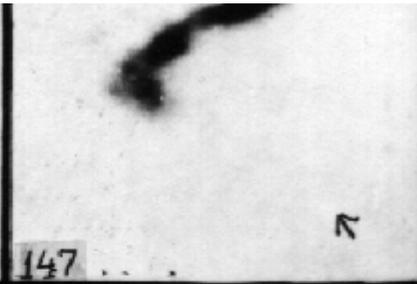
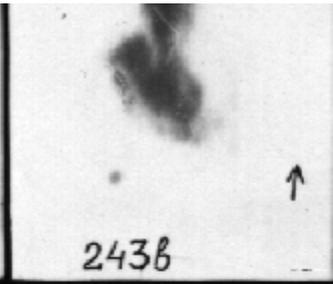
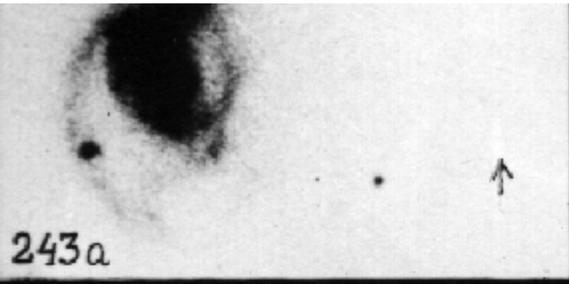
Hubble

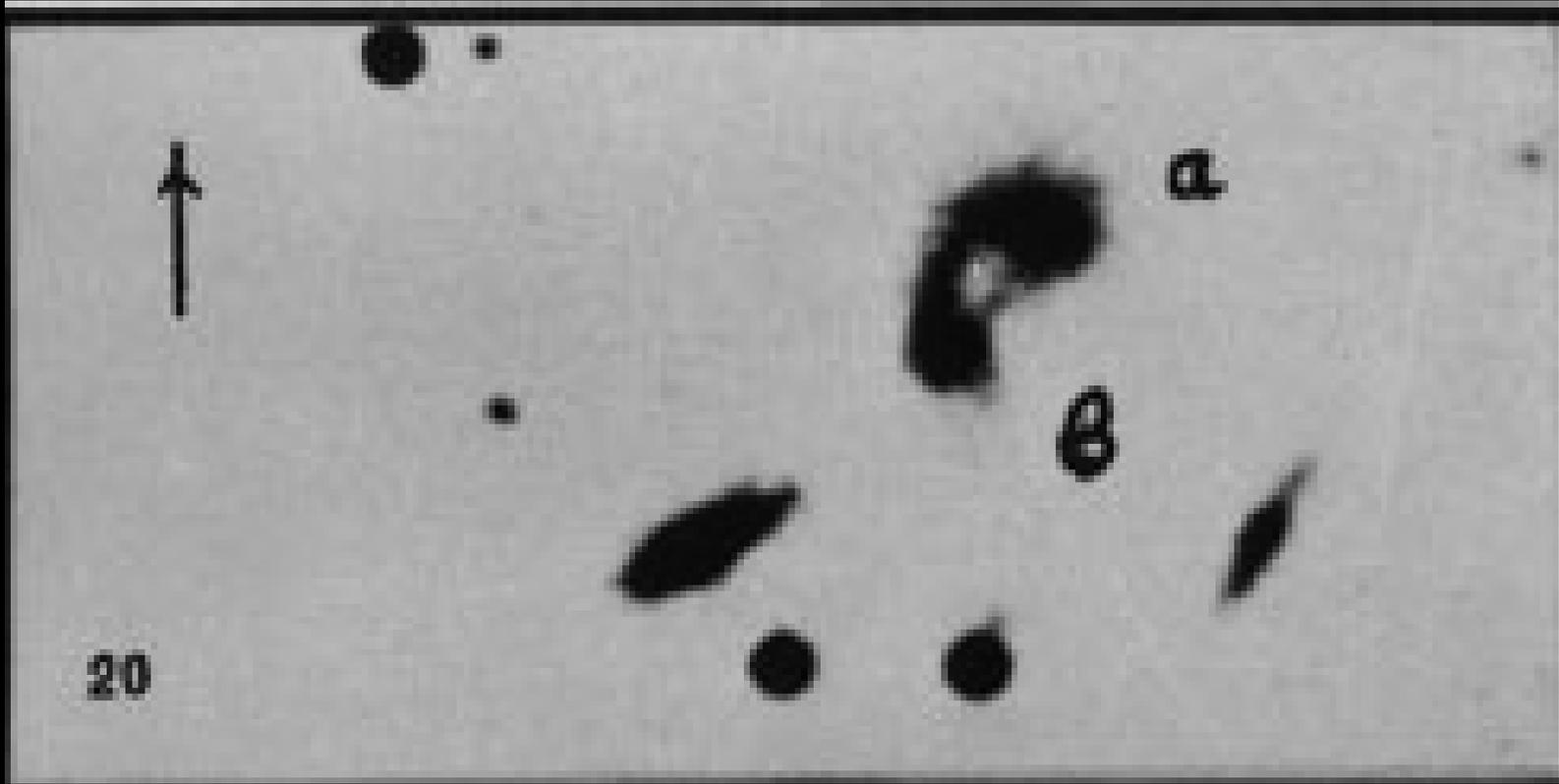
VV1308=Arp252

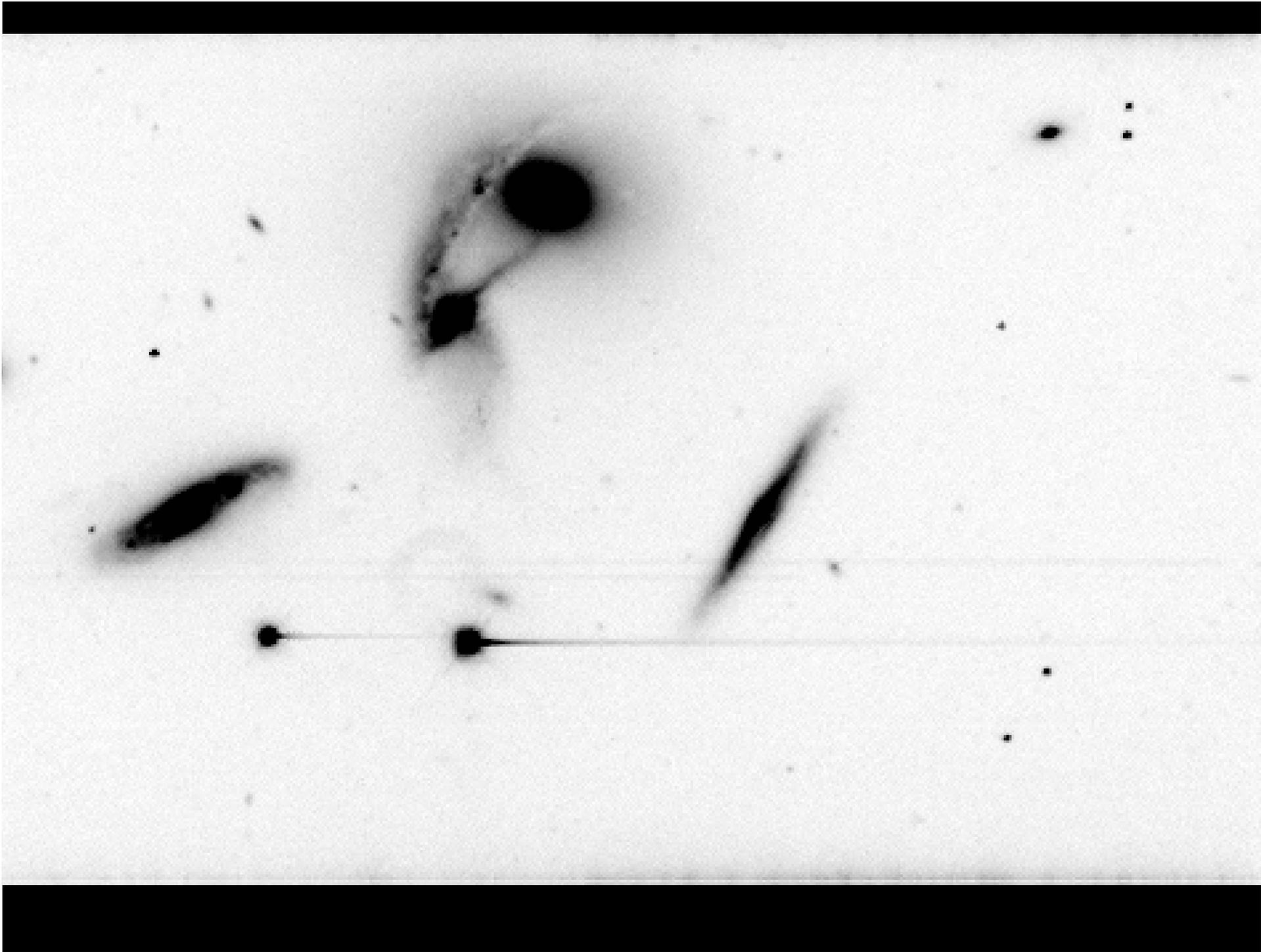


④









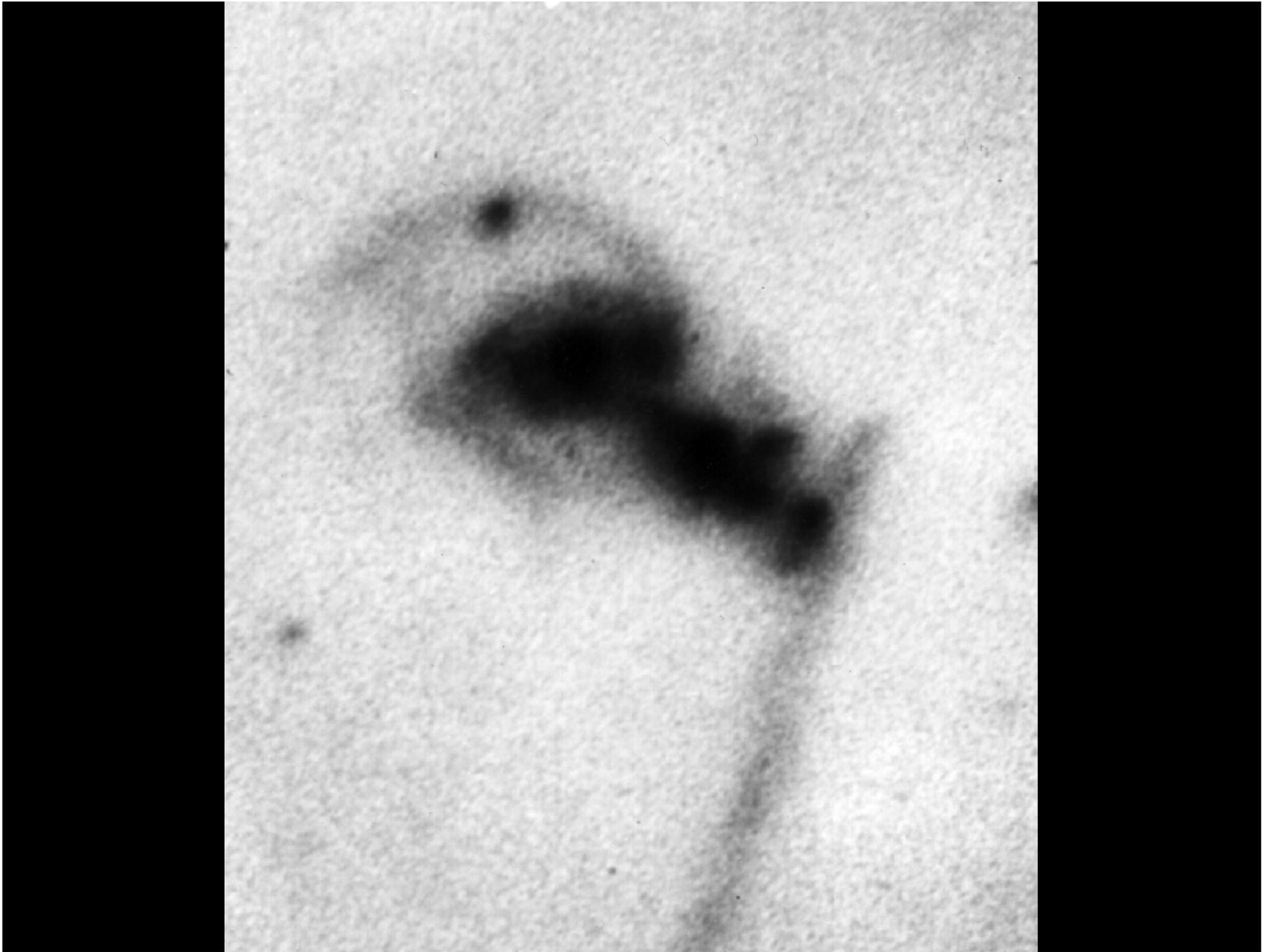
VV 33



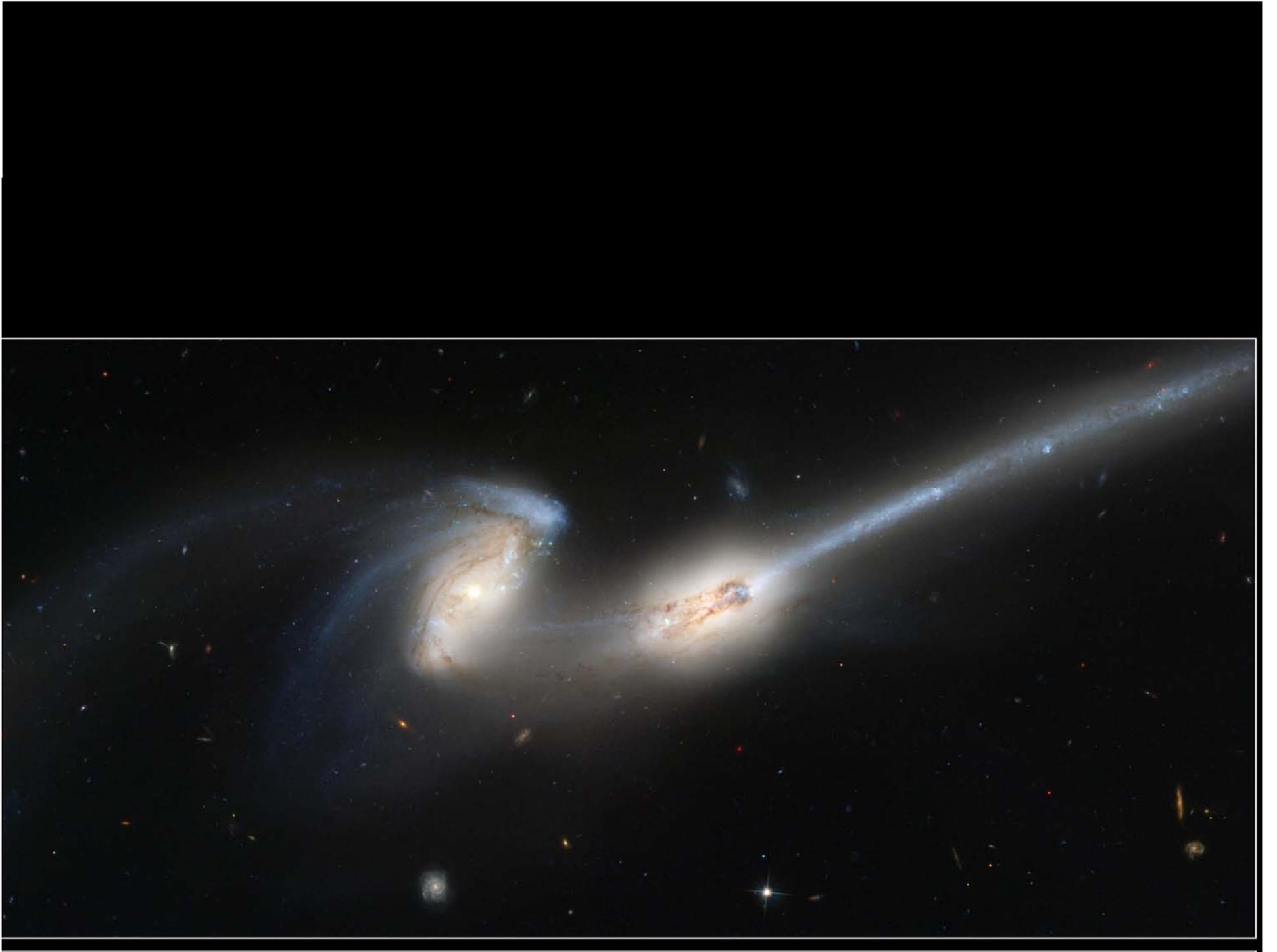
6

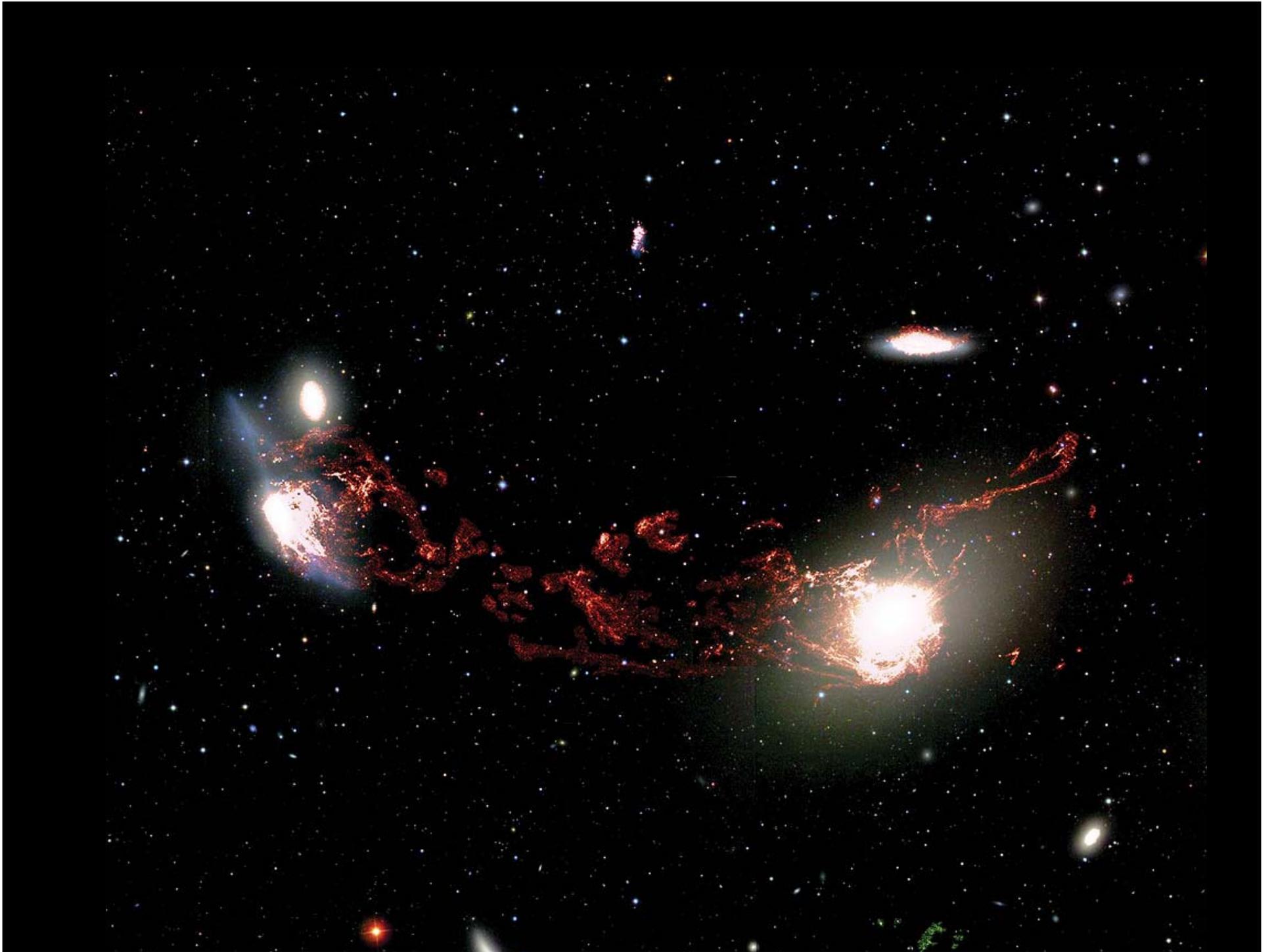
33

9





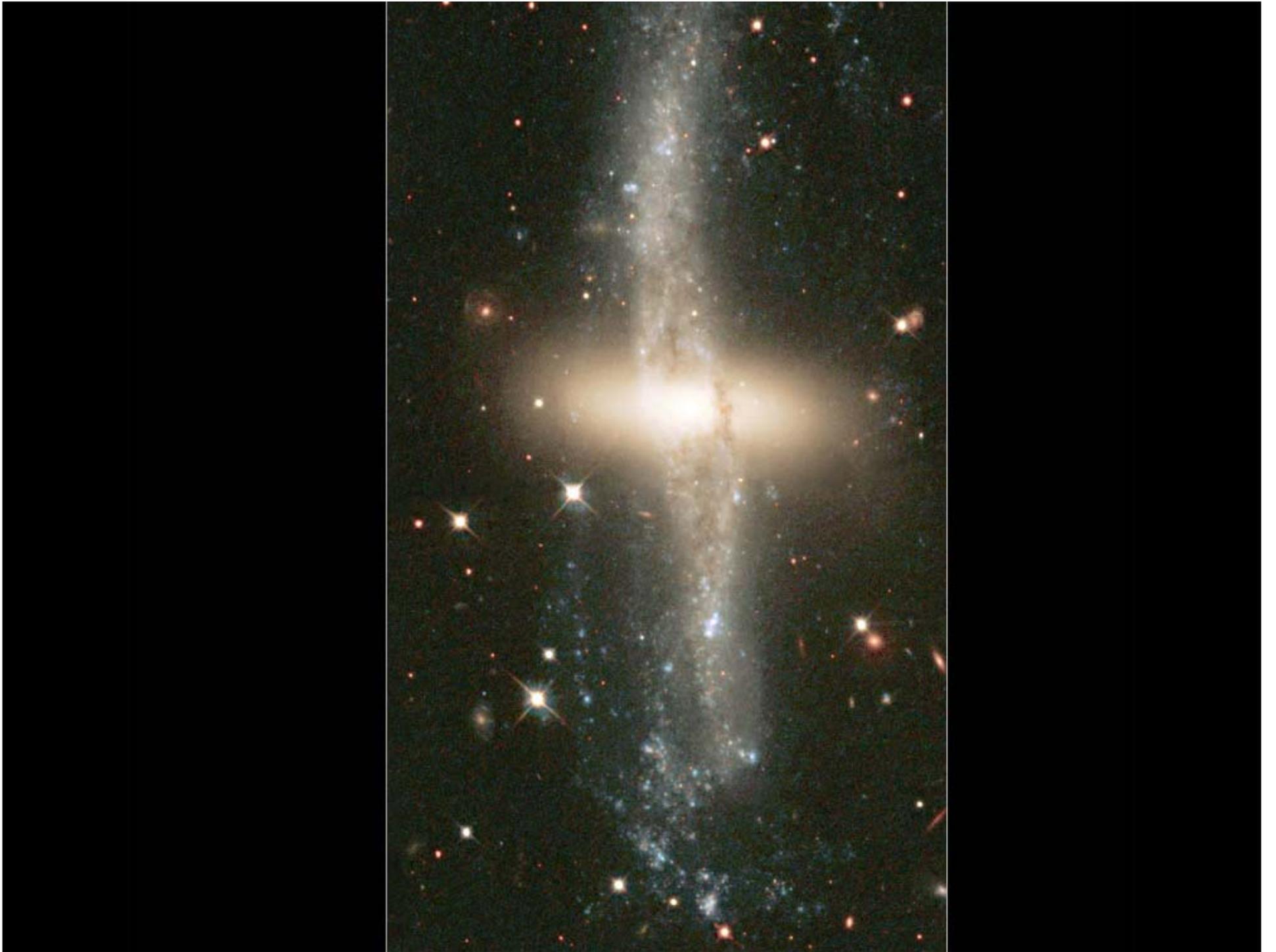




Arp295







Основные причины искажения форм галактик:

- Изменение конфигурации гравитационного поля при сближении галактик
- Перестройка орбит звезд и газовых облаков (происходит по разному)

...Приливное, т.е. гравитационное взаимодействие, даже при применении грубых моделей, объясняет многое, но, по-видимому, недостаточно для этих сложных явлений природы.

Б.А.Воронцов-Вельяминов.

Гигантские эллиптические и
линзовидные галактики в
скоплениях

-возможно, результат слияния
более мелких галактик

Гигантская E-галактика NGC 1132 (300 млн.свет. лет).





Hubble



А ЧТО ПРОИСХОДИТ
ВНУТРИ СТАЛКИВАЮЩИХСЯ
ГАЛАКТИК?

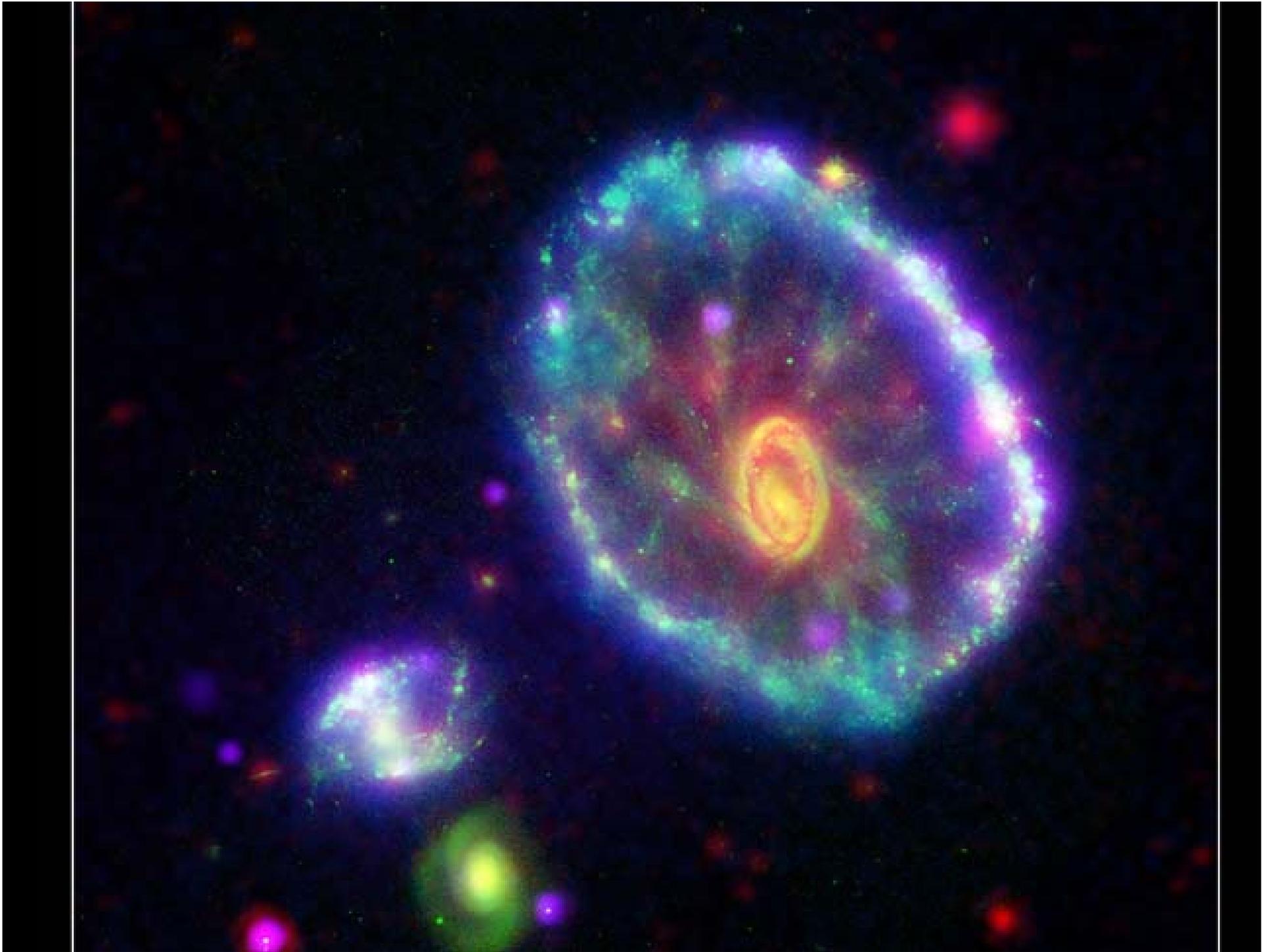


- Возникают ударные волны в разреженном межзвездном газе
- Усиливается звездообразование (если есть из чего звездам образовываться)
- Просыпается активное ядро (не всегда!).

Interacting Galaxy System NGC 6745







Ring Galaxy AM 0644-741



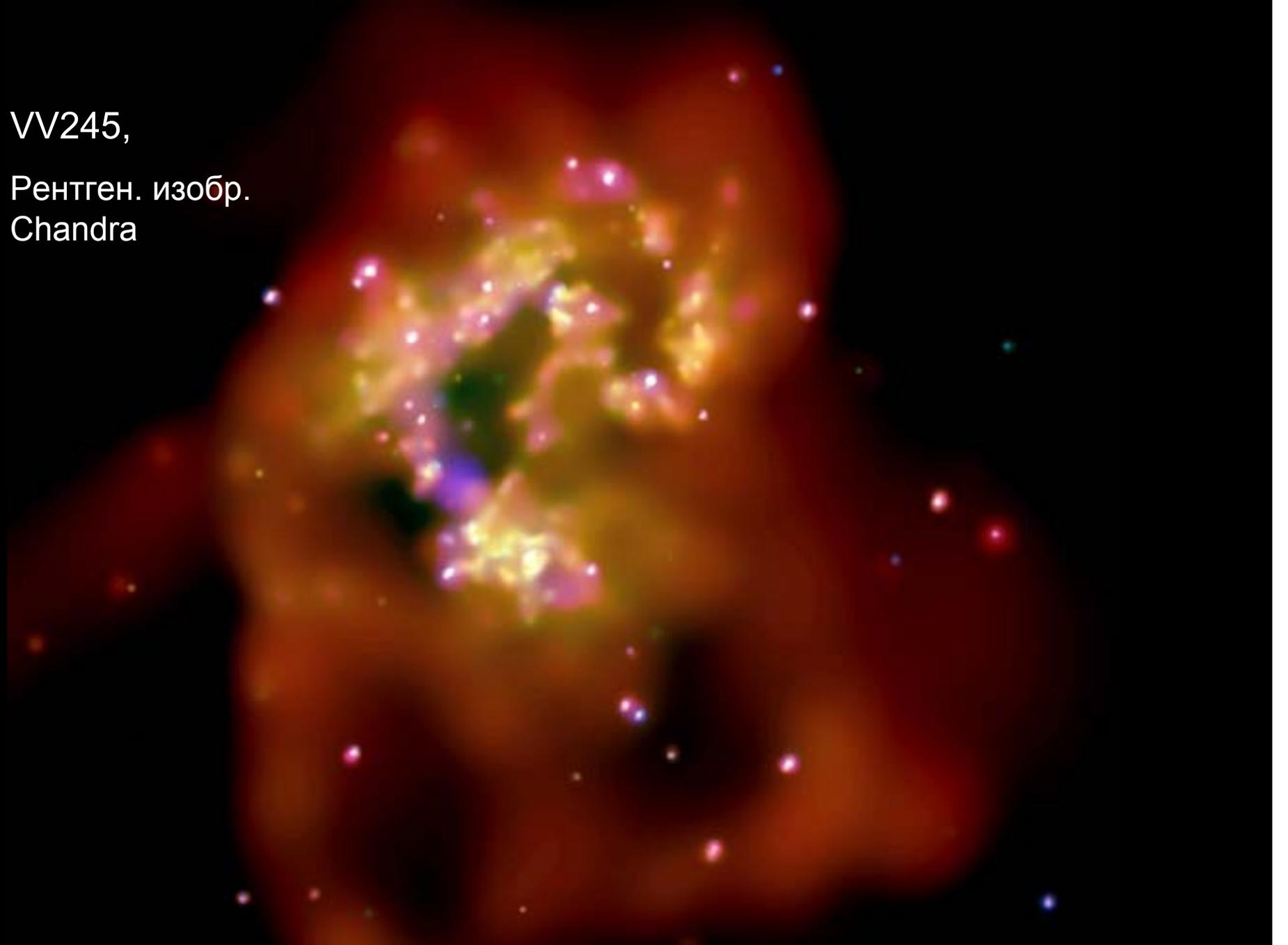




VV245,

Рентген. изобр.

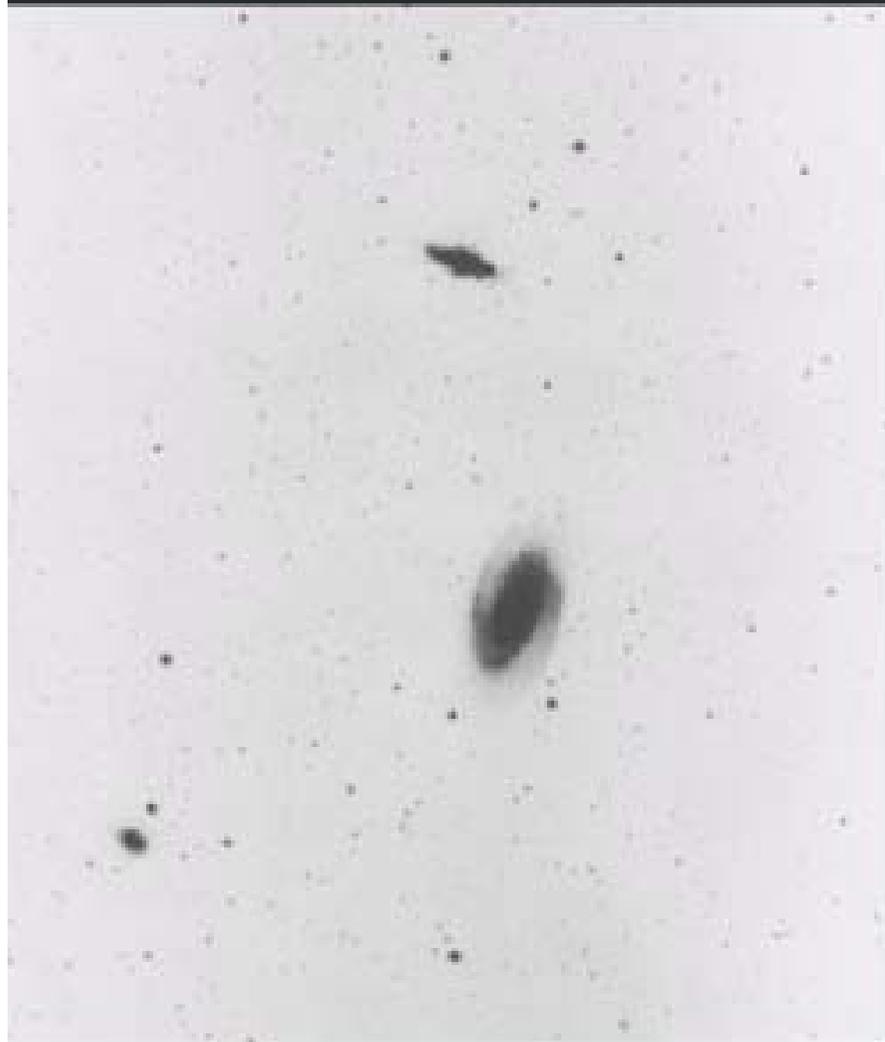
Chandra



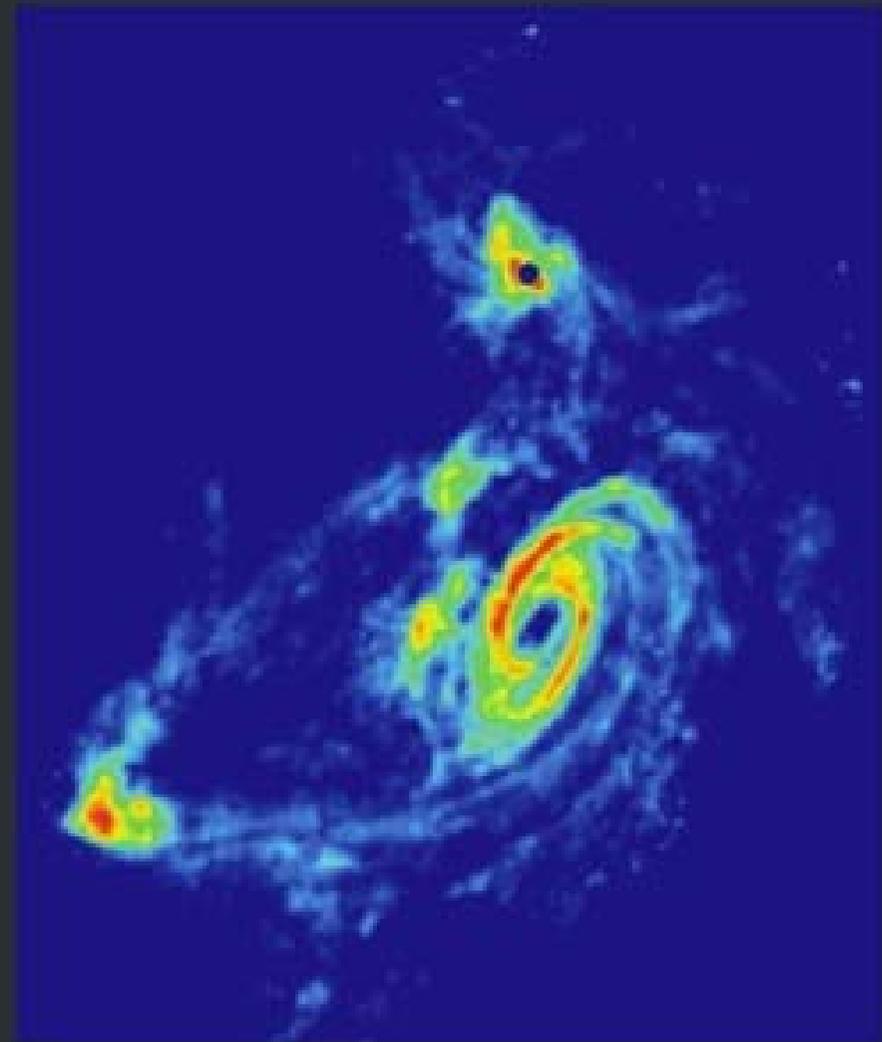


TIDAL INTERACTIONS IN M81 GROUP

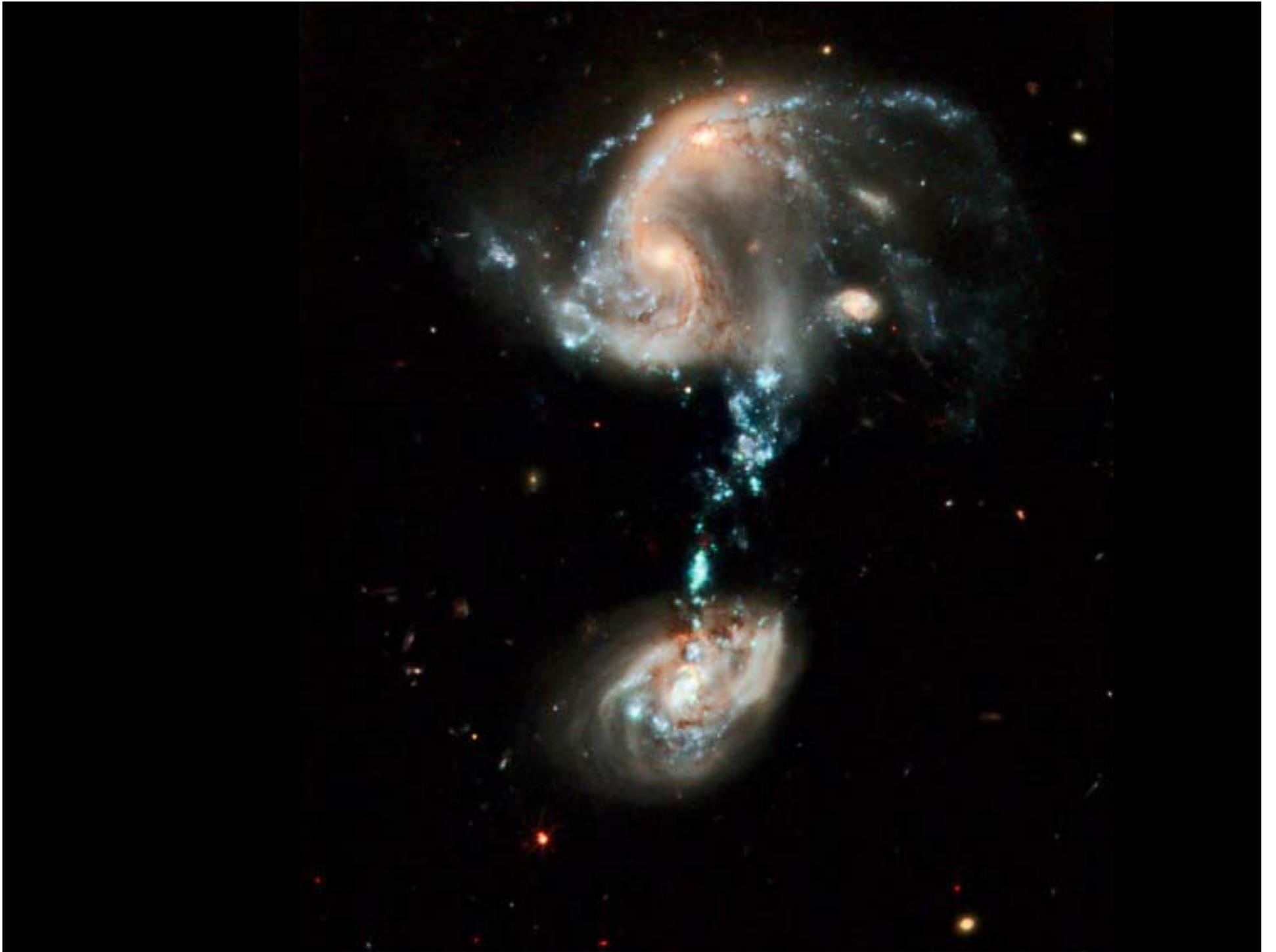
Stellar Light Distribution



21 cm HI Distribution

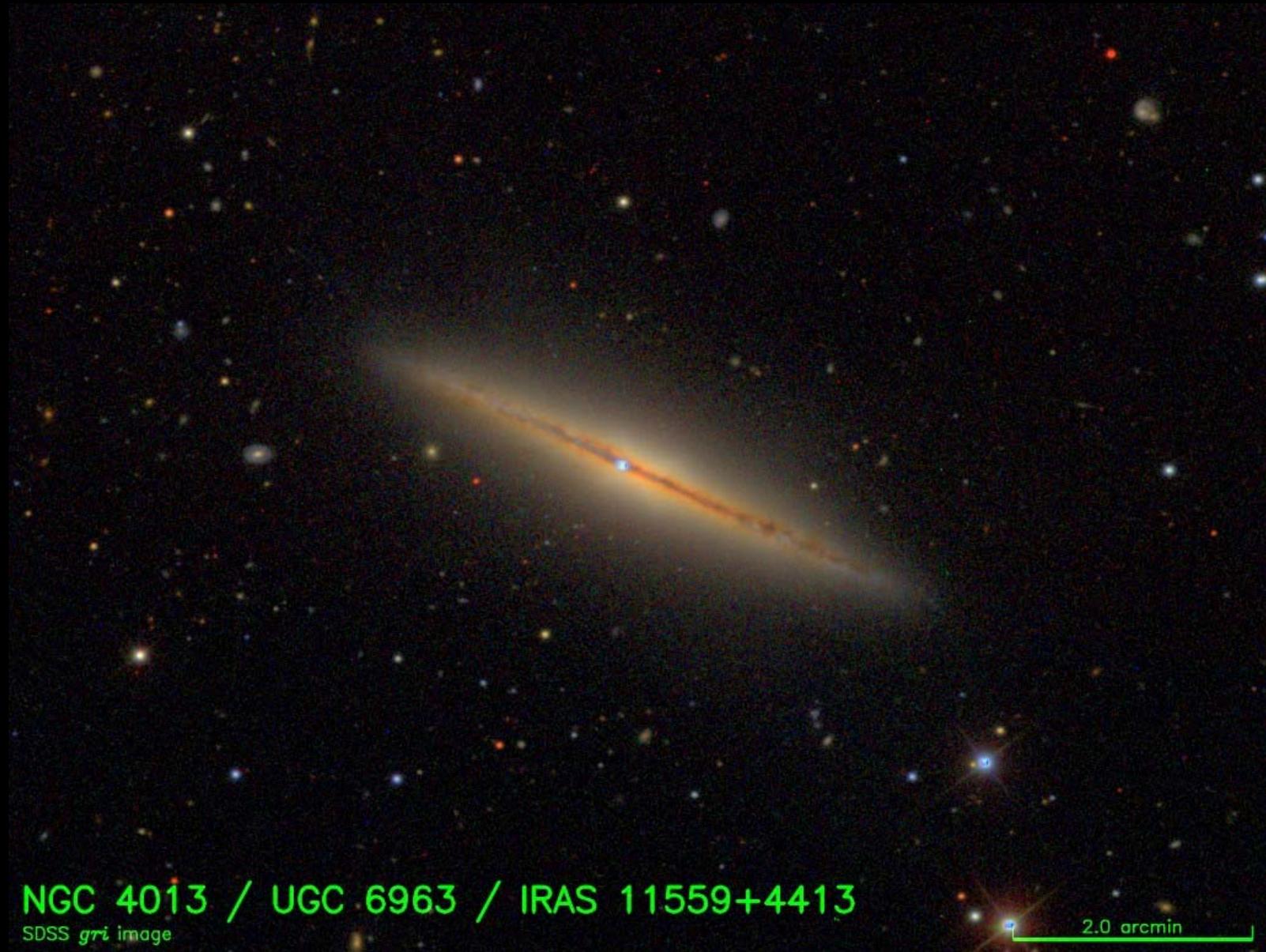






К чему приводит столкновение с
мелкими спутниками?





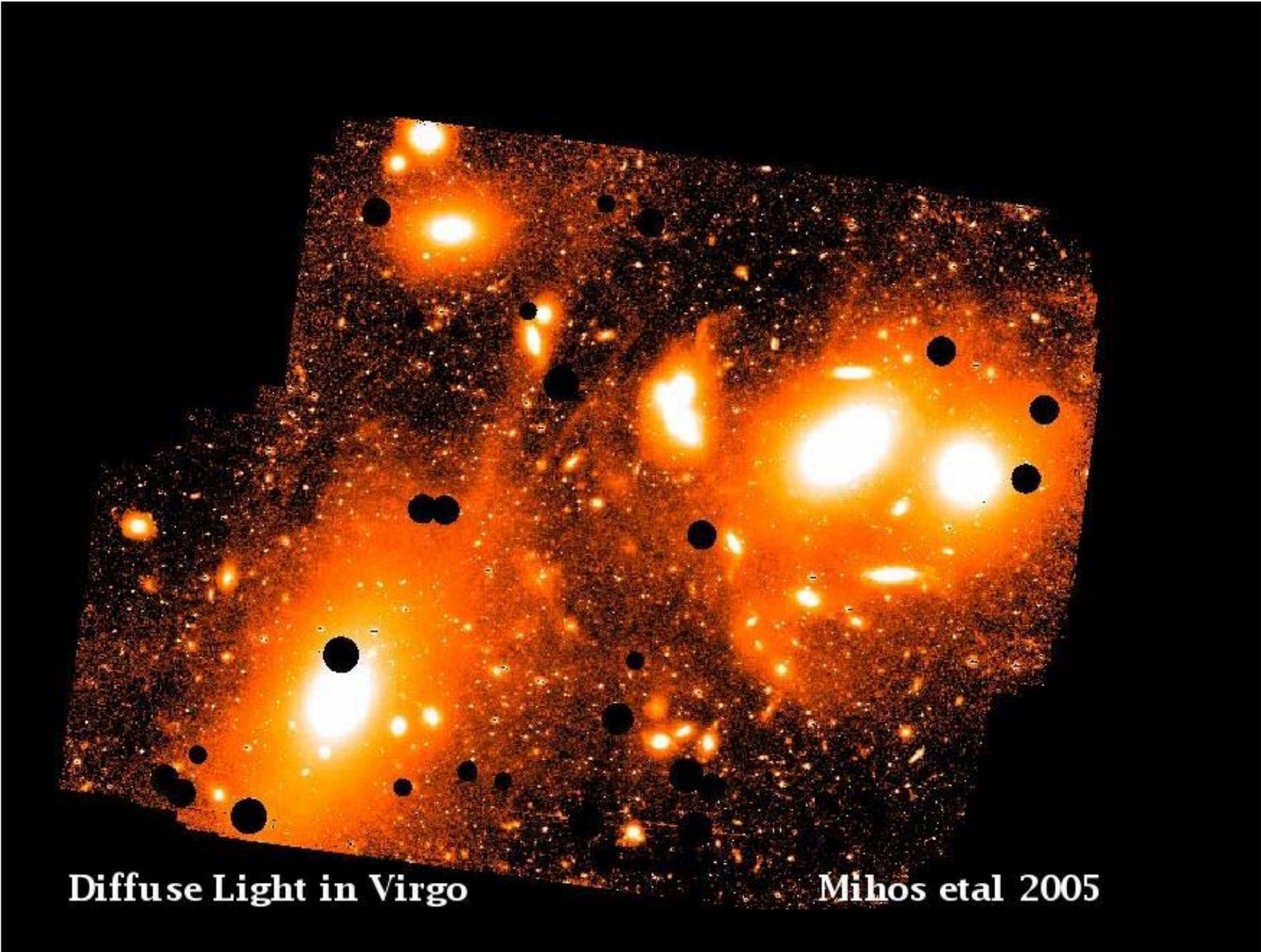
NGC 4013 / UGC 6963 / IRAS 11559+4413

SDSS *gri* image

2.0 arcmin



- В скоплениях галактик столкновения галактик играют особую роль

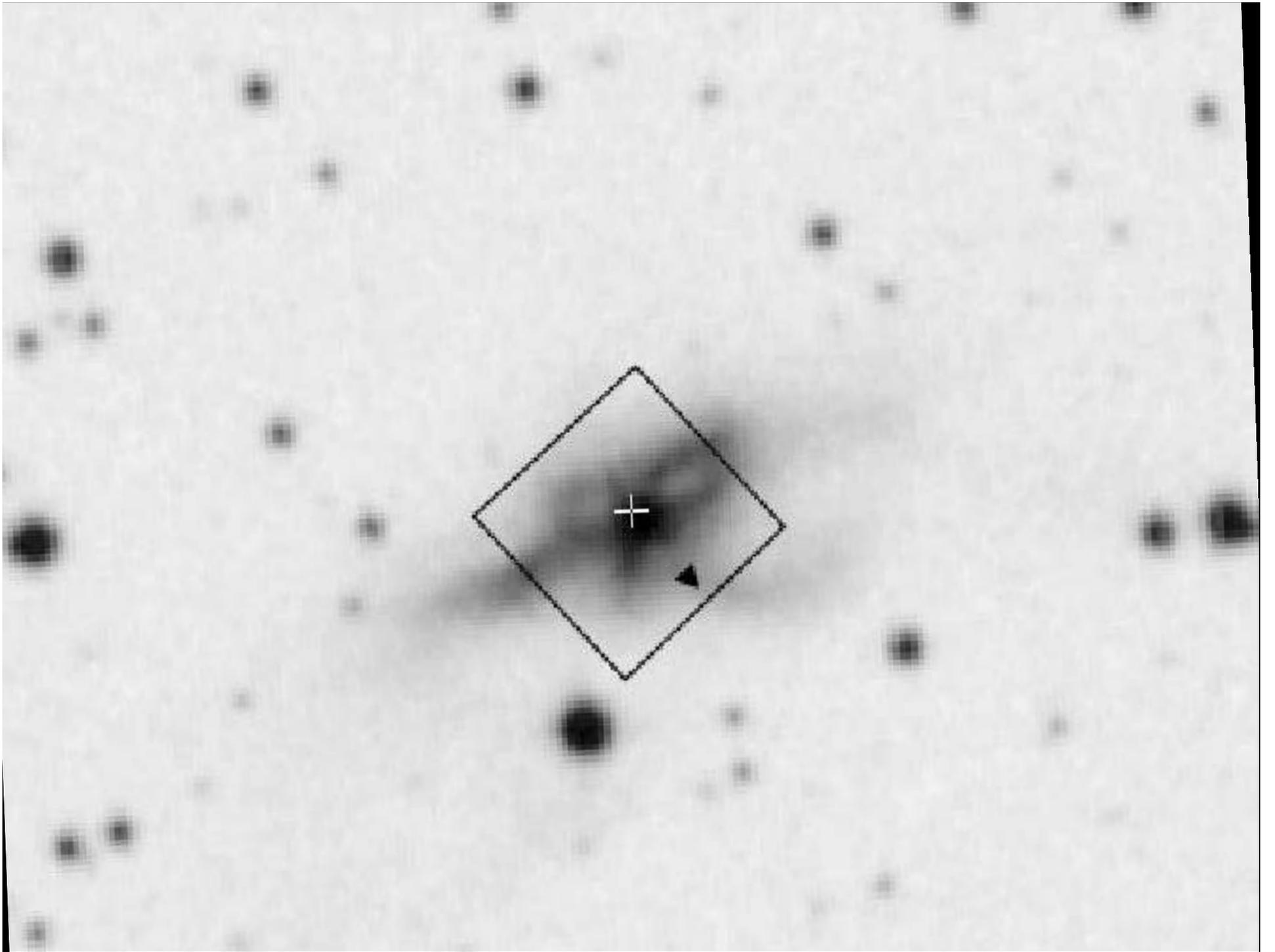
This astronomical image displays the diffuse light in the Virgo galaxy cluster. The background is a dense field of small, faint galaxies, with a prominent orange-red glow indicating the presence of intergalactic dust. Several bright, white-yellow galaxies are scattered throughout the field. Numerous black circular markers are overlaid on the image, likely representing the positions of specific galaxies or stars. The overall appearance is that of a rich, multi-colored galaxy cluster.

Diffuse Light in Virgo

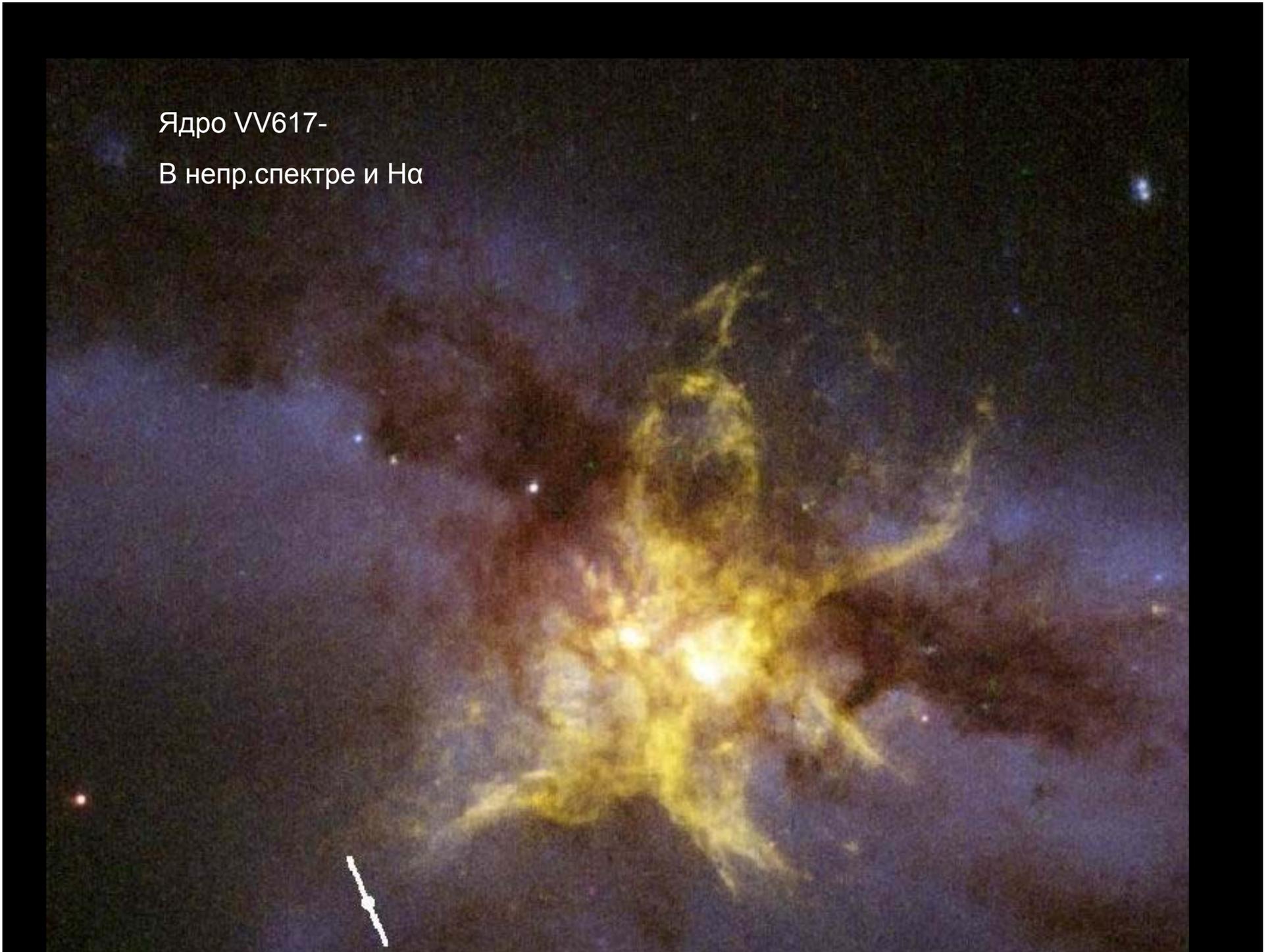
Mihos et al 2005

Сливаются не только галактики

- Могут сливаться центральные сверхмассивные черные дыры
- Часть межзвездного газа также смещается к центру галактики и может служить топливом для активного ядра



Ядро VV617-
В непр. спектре и H α



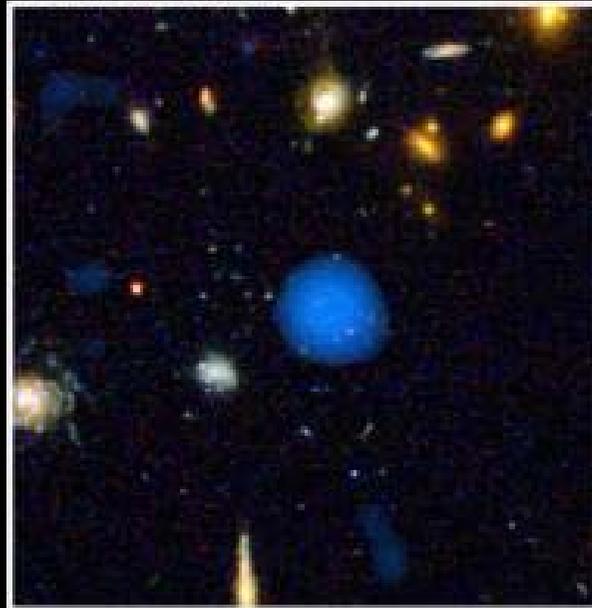
«РЕЛИКТОВЫЙ» ТИП ГАЛАКТИК

СУБМИЛЛИМЕТРОВЫЕ ГАЛАКТИКИ

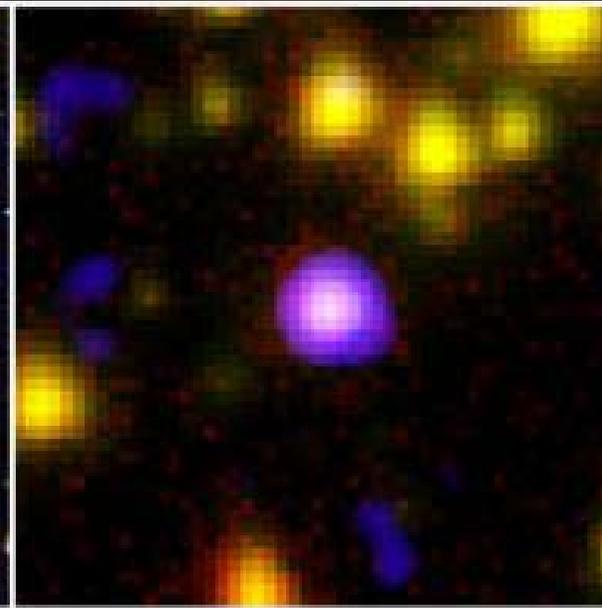
В настоящее время в природе не существуют



033213.9-275000

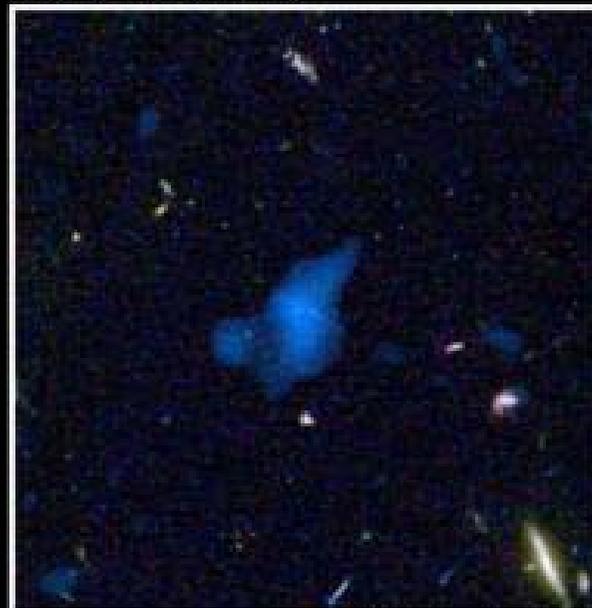


X-RAY & OPTICAL

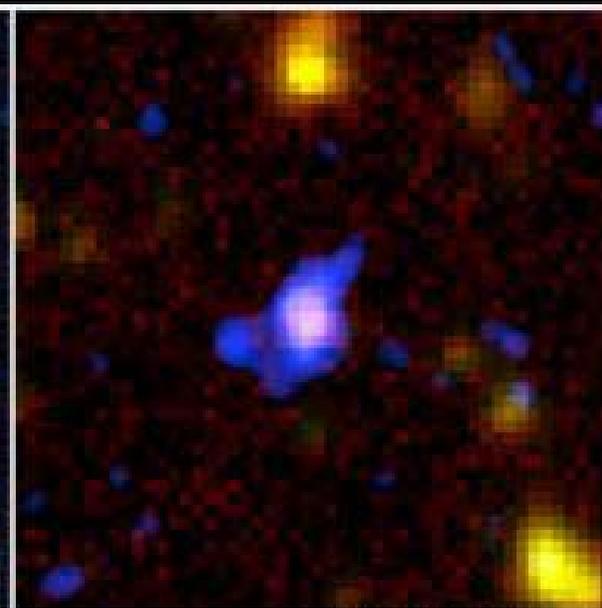


X-RAY & INFRARED

033251.6-275212



X-RAY & OPTICAL



X-RAY & INFRARED

ЭТО ВАЖНО:

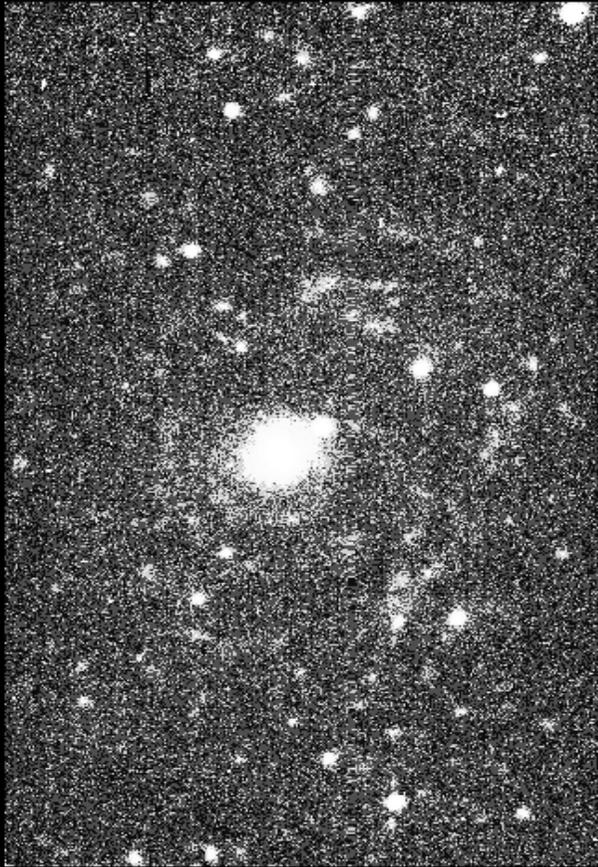
- На более близких расстояниях (в пределах нескольких миллиардов световых лет от нас) таких галактик как субмиллметровые галактики **НЕ ОБНАРУЖЕНО!**

ГАЛАКТИКИ-ПРИЗРАКИ

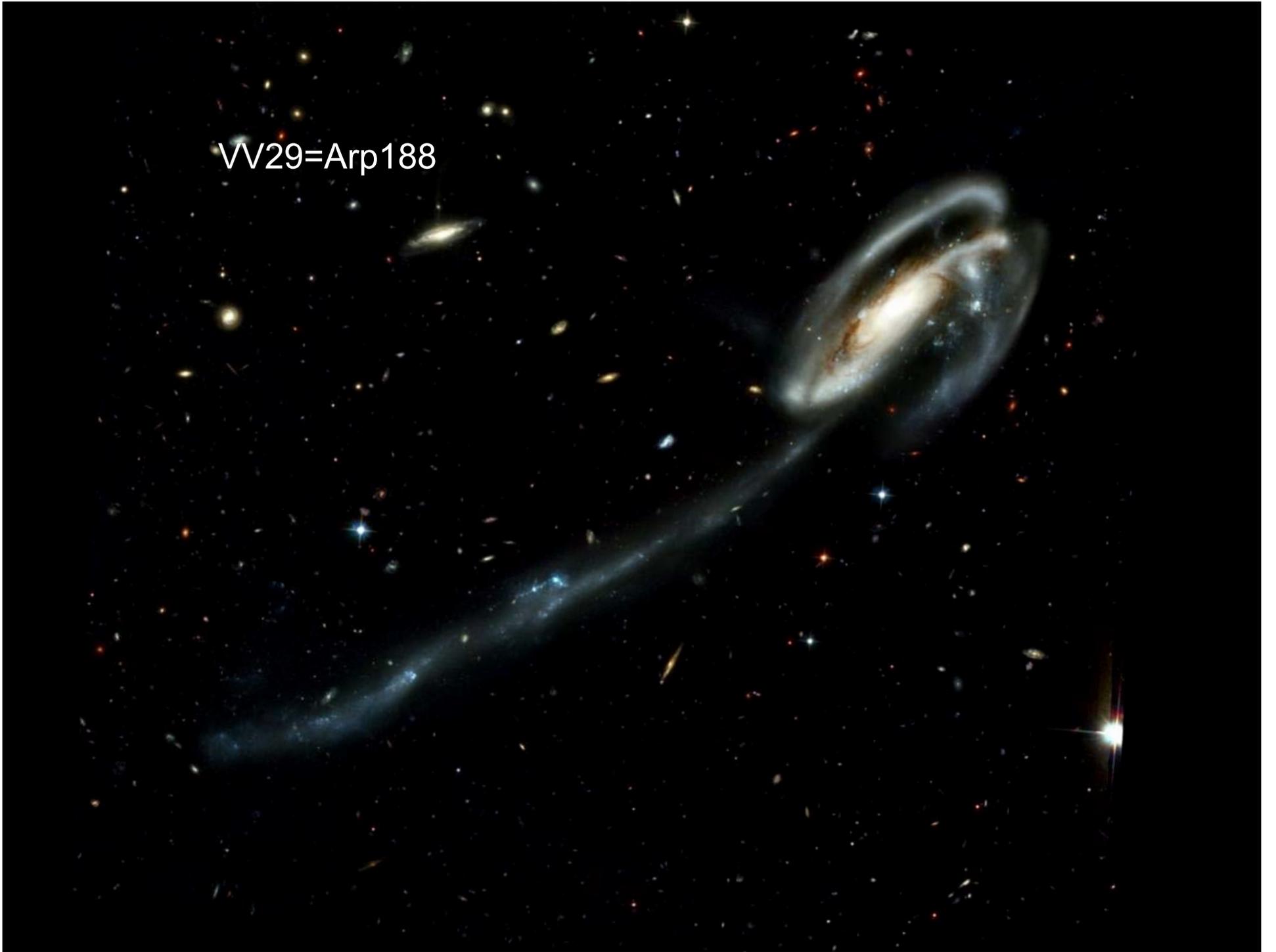
- Массы 10^{10} – 10^{11} масс Солнца
- Скорости вращения 100 -200 км/с
- Светимость – в 10 – 1000 раз ниже, чем у обычных галактик такой же массы

Run 94 Col 6 Field 127

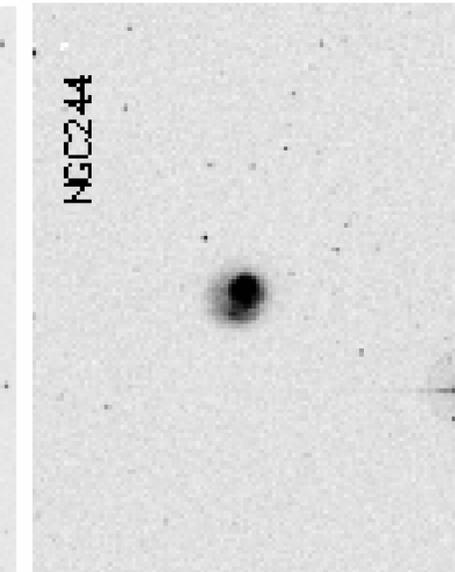
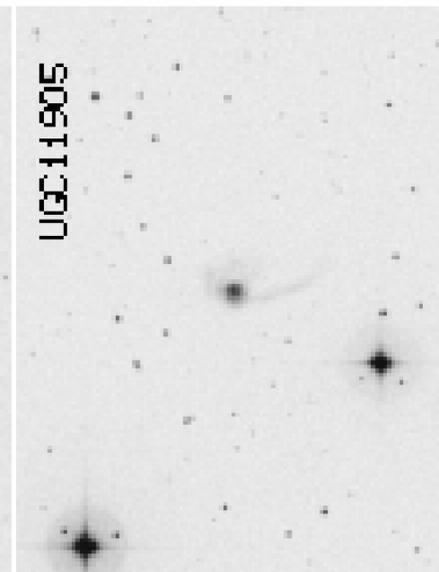
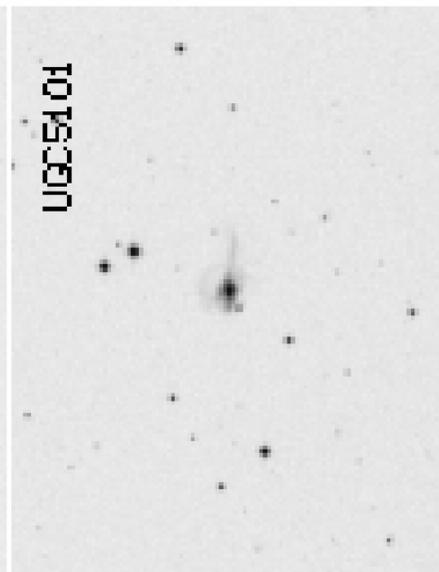
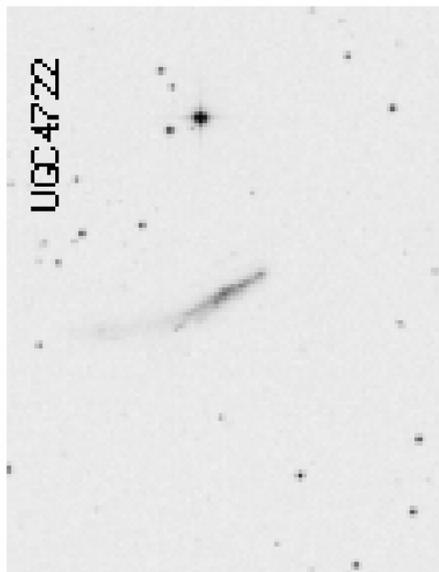
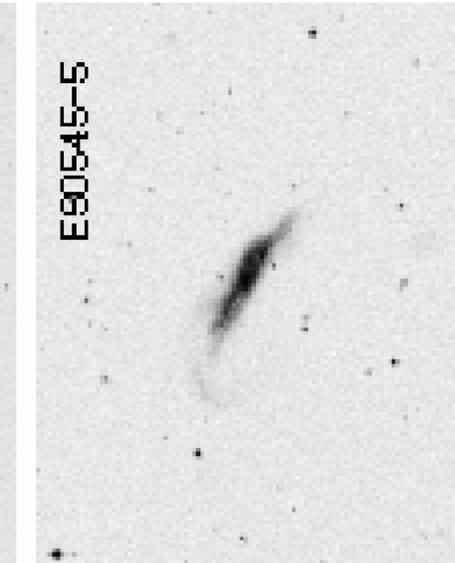
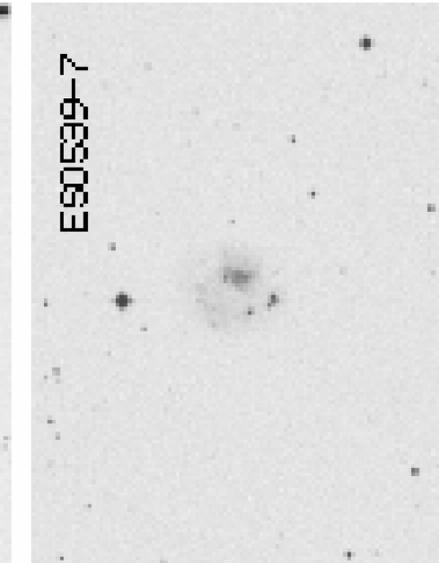
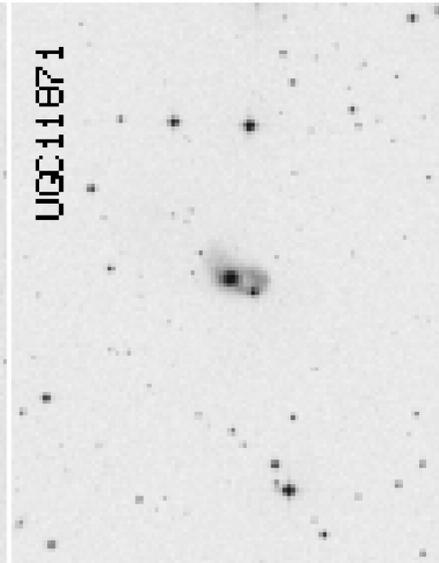
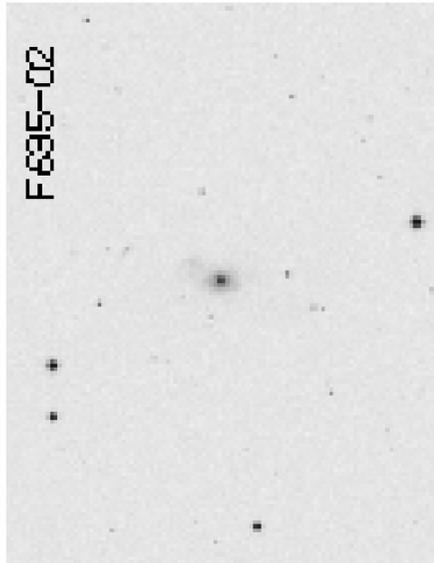




VV29=Arp188



«ОДИНОЧНЫЕ ВЗАИМОДЕЙСТВУЮЩИЕ» ГАЛАКТИКИ
(Караченцев и др., 2006)



САМЫЙ ТАИНСТВЕННЫЙ
ОБЪЕКТ –
объект Ханны



Welcome to Galaxy Zoo, where you can help astronomers explore the Universe

Galaxy Zoo: Hubble uses gorgeous imagery of hundreds of thousands of galaxies drawn from NASA's Hubble Space Telescope archive. To understand how these galaxies, and our own, formed we need your help to classify them according to their shapes — a task at which your brain is better than even the most advanced computer. If you're quick, you may even be the first person in history to see each of the galaxies you're asked to classify.

More than 250,000 people have taken part in Galaxy Zoo so far, producing a wealth of valuable data and sending telescopes on Earth and in space chasing after their discoveries. The images used in Galaxy Zoo: Hubble are more detailed and beautiful than ever, and will allow us to look deeper into the Universe than ever before. To begin exploring, click the 'How To Take Part' link above, or read [The Story So Far](#) to find out what Galaxy Zoo has achieved to date.

Thanks for your help, and happy classifying.

The Galaxy Zoo team.

Classifier Log In

[Click here to log in](#)

- [Register](#)
- [Forgotten Password?](#)

Explore galaxies

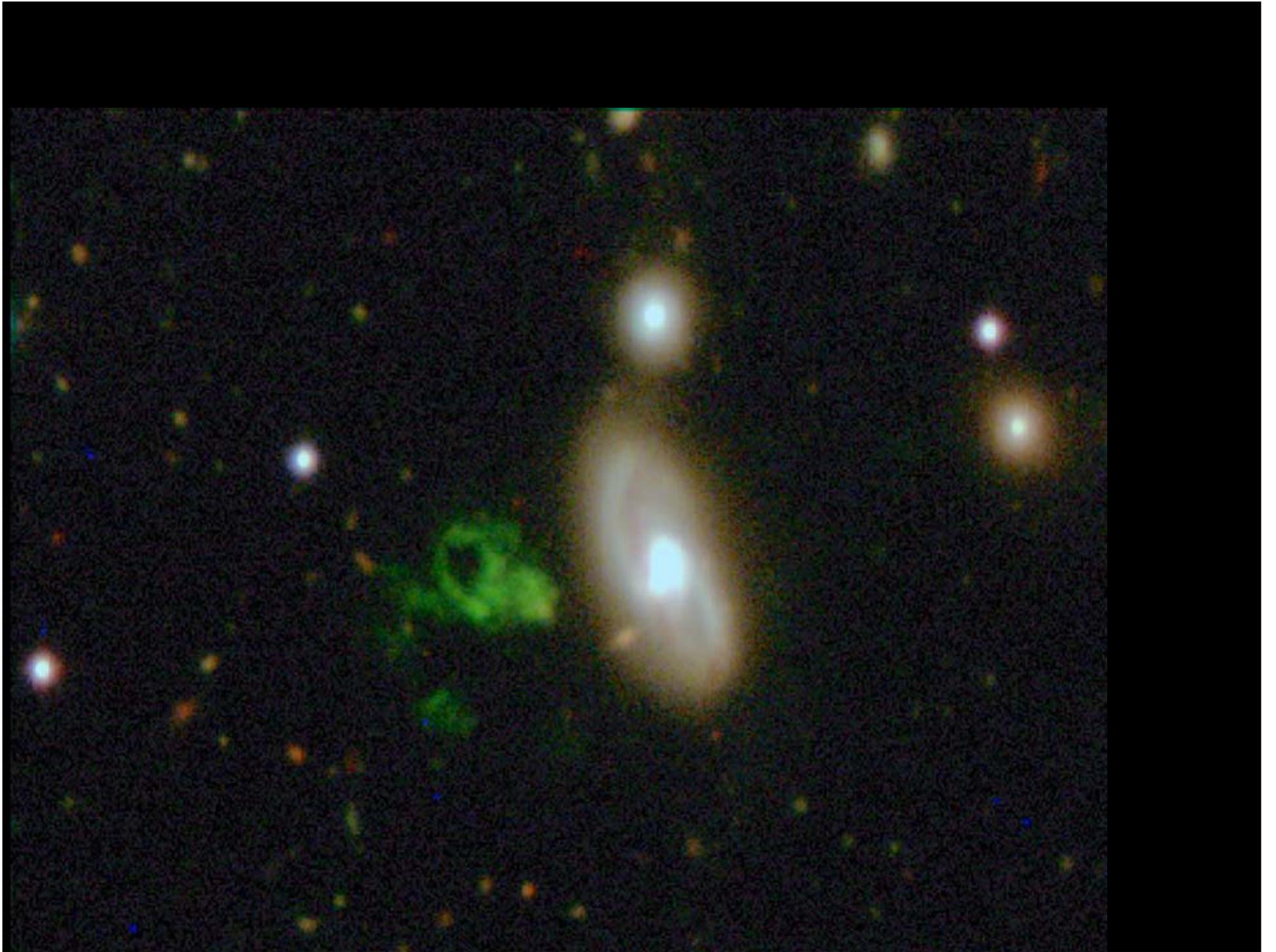
Latest News

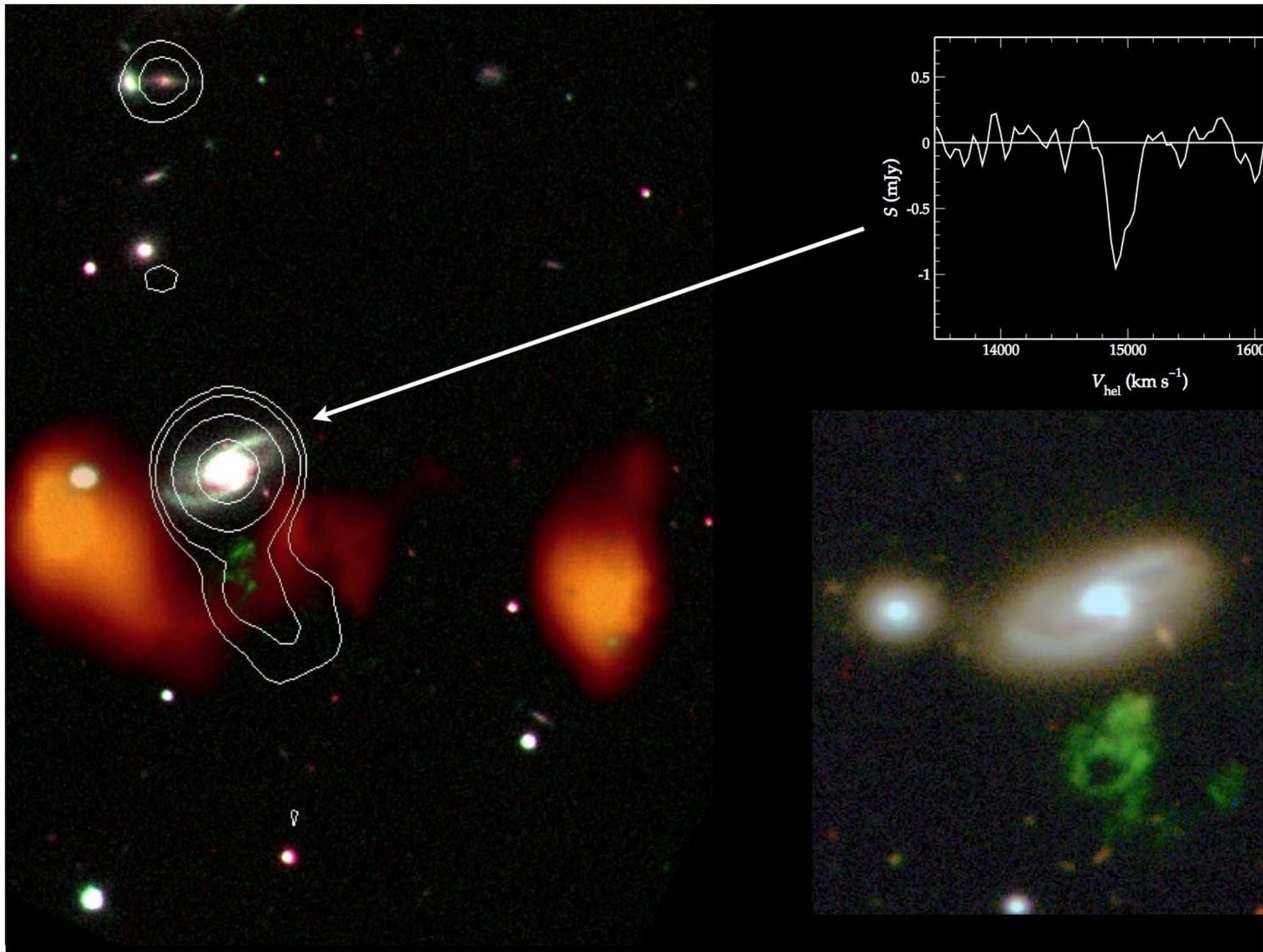
[Galaxy Zoo classifications in SDSS Database](#)

Автор: Karen Masters - 12 янв 2011

The latest release of data from the Sloan Digital Sky Survey happened yesterday (SDSS3 blog article about the release).

[This Voorwerpje paper submitted](#)



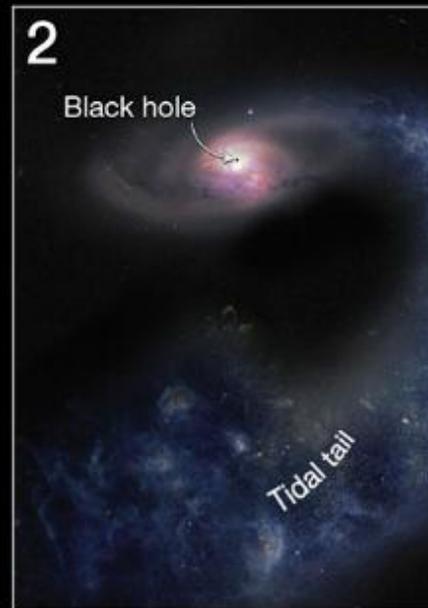


Модель формирования объекта

Hanny's Voorwerp: a space oddity



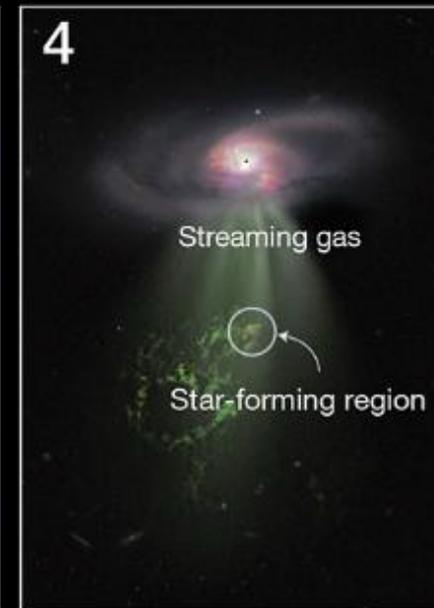
Spiral galaxy IC 2947 gravitationally interacts with a bypassing galaxy



A large tidal tail of gas is pulled out of the spiral galaxy



Engorged with gas, a black hole at the centre of IC 2947 "turns on" as a quasar and emits a powerful cone of light, which ionises a portion of the tidal tail, creating Hanny's Voorwerp



Gas streaming out from the galaxy centre impacts the tidal tail and triggers star formation

A deep-field astronomical image showing a vast field of galaxies in various colors and shapes against a black background. The galaxies are scattered across the frame, with some appearing as bright, distinct points of light and others as faint, diffuse structures. The colors range from bright yellow and orange to deep blue and purple. The overall appearance is that of a rich, multi-colored population of galaxies from the early universe.

Галактики в далеком прошлом

А что с нашей Галактикой?

- Она – «слабо взаимодействующая»

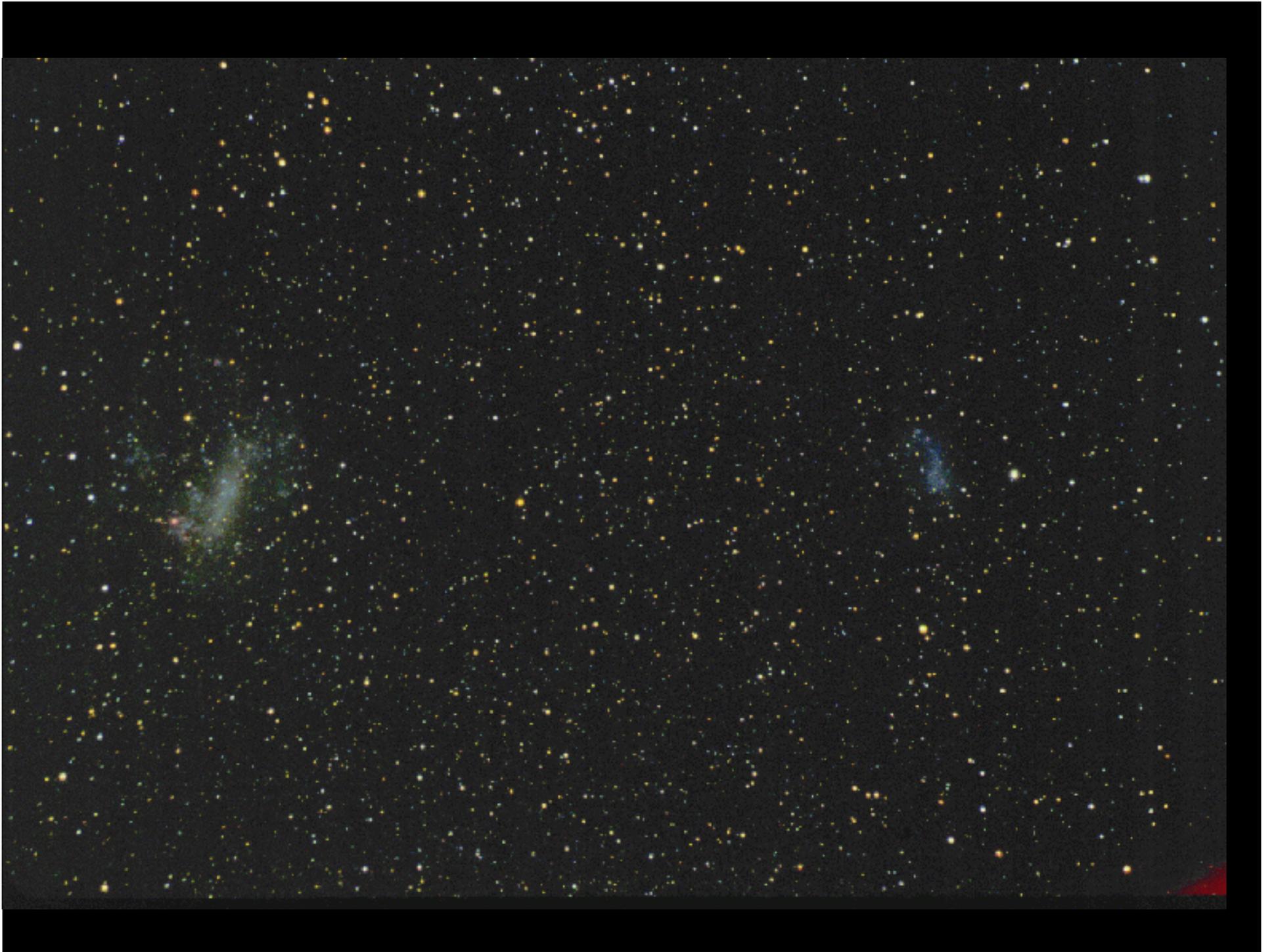
100000 световых лет

Наша галактика

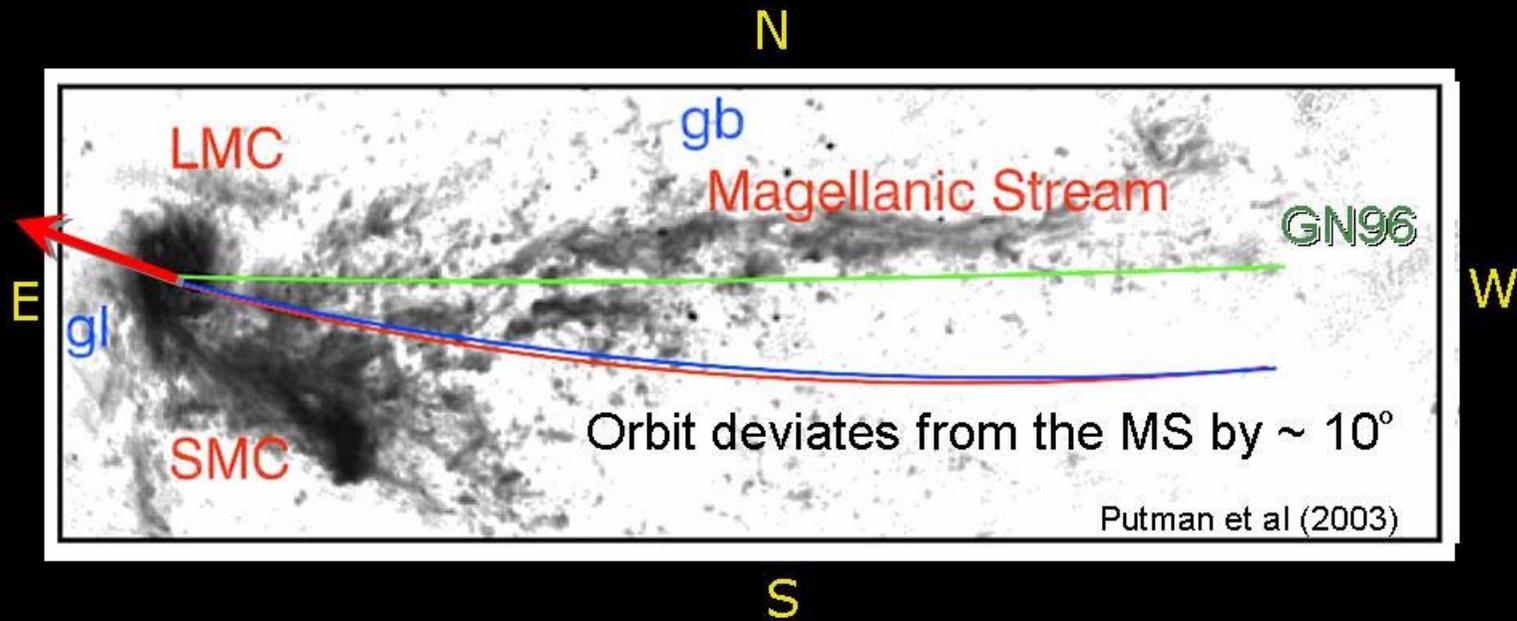
Большое Магелланово облако

Малое Магелланово облако





HI: LMC+SMC + Магелланов поток



Омега Центавра –
Ядро разрушившейся галактики?

