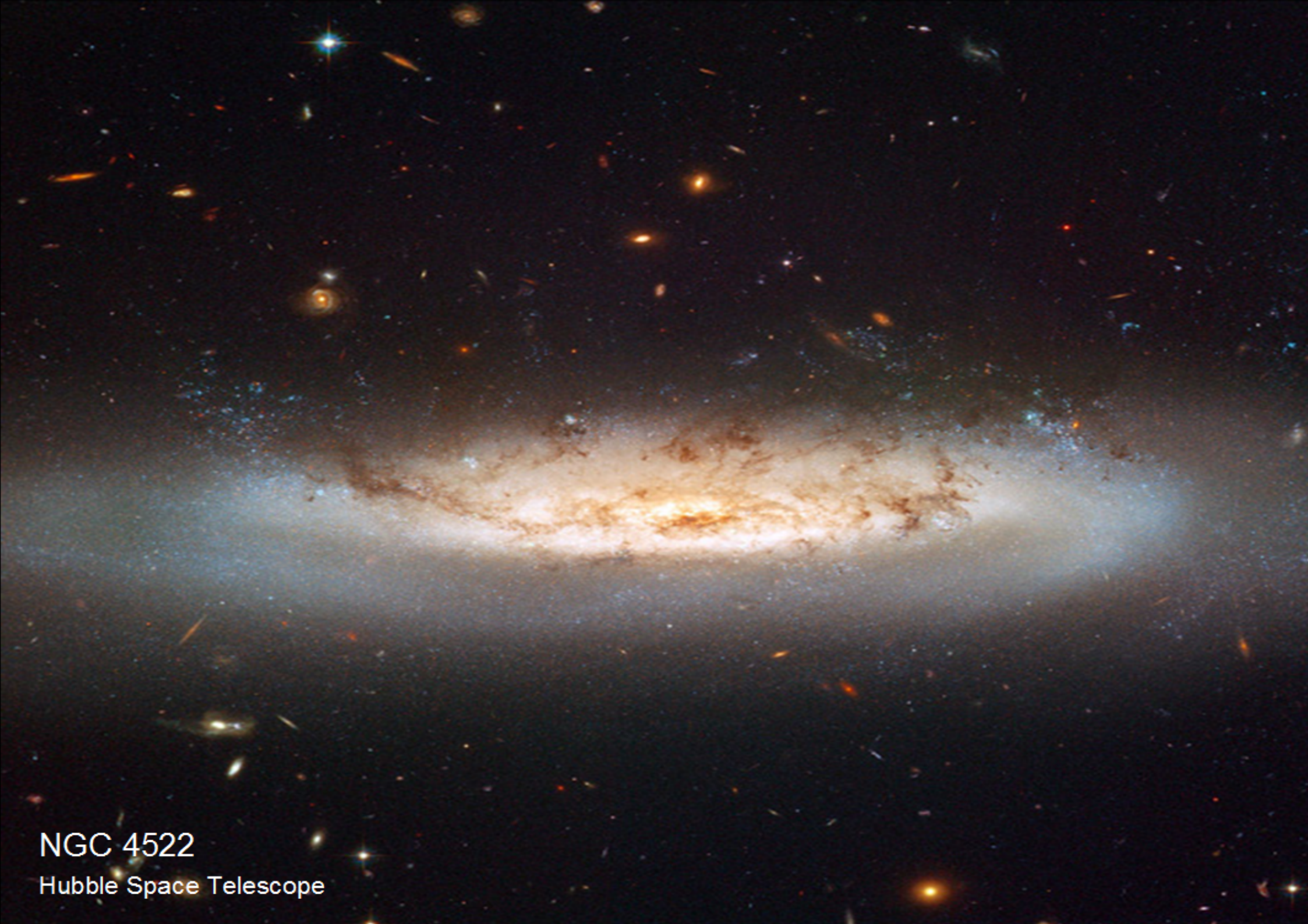


Ram-Pressure Stripping

Vergleich von Beobachtungen
und Simulationen

Überblick

- Prozess
- Simulationen
- Ergebnisse / Folgerungen

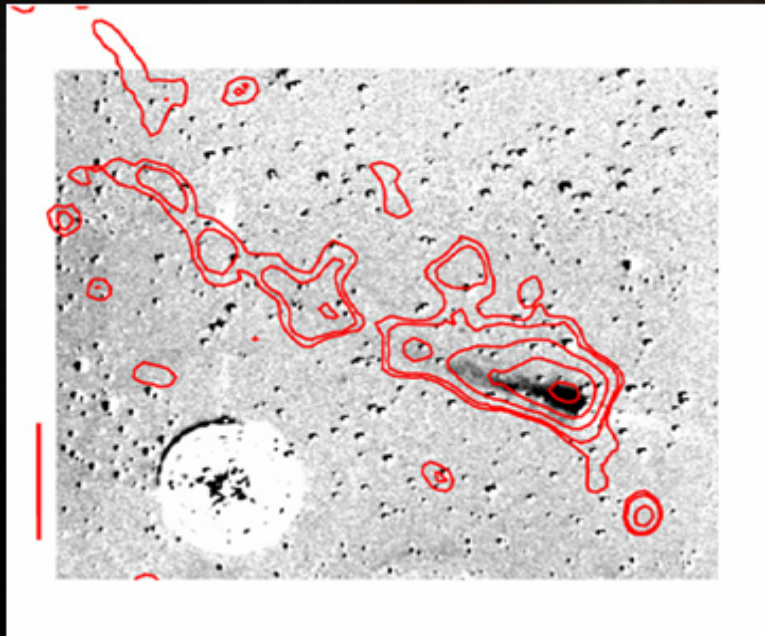


NGC 4522

Hubble Space Telescope

Prozess

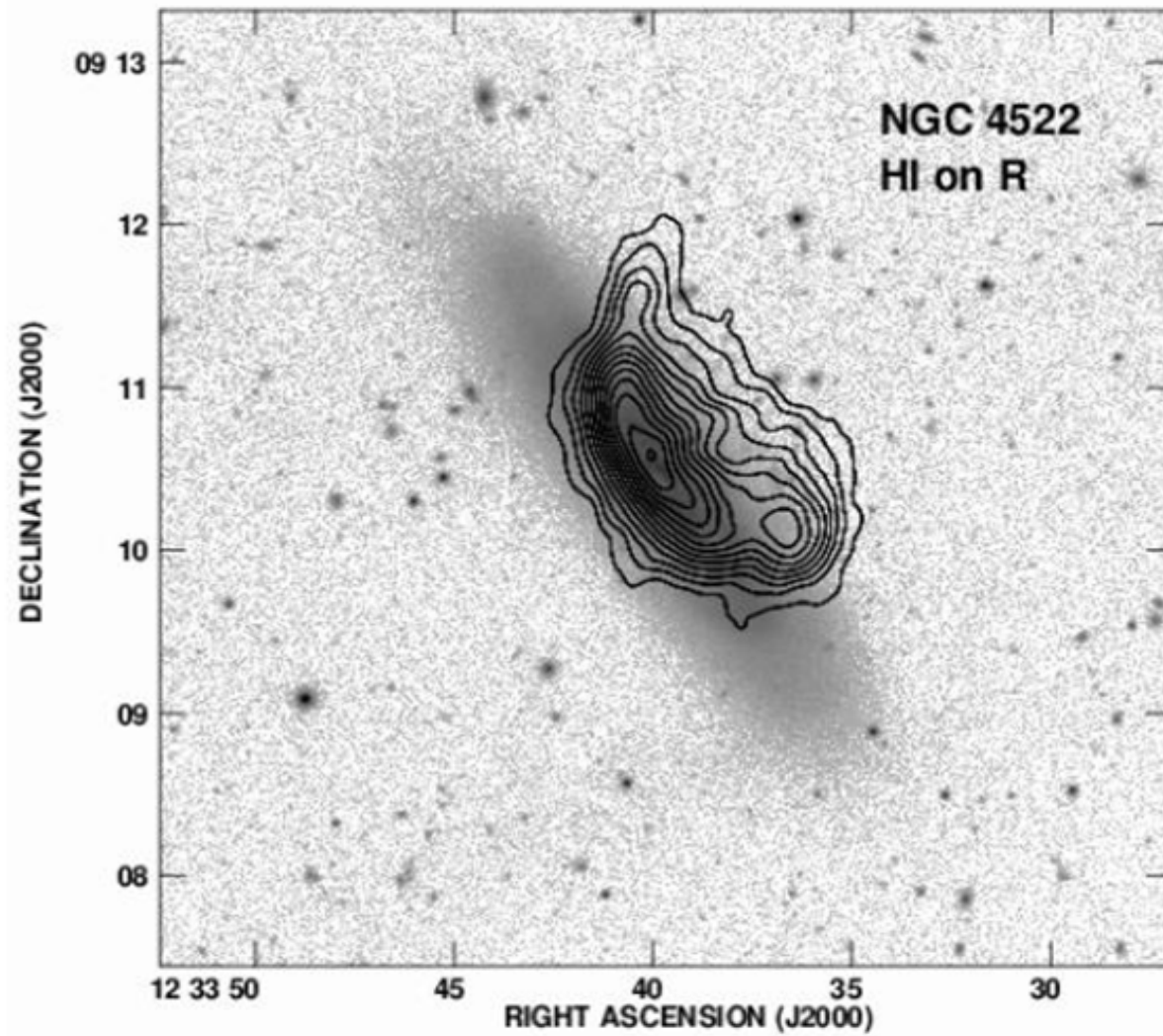
- Was sehen wir?
 - HI
 - Röntgenbereich



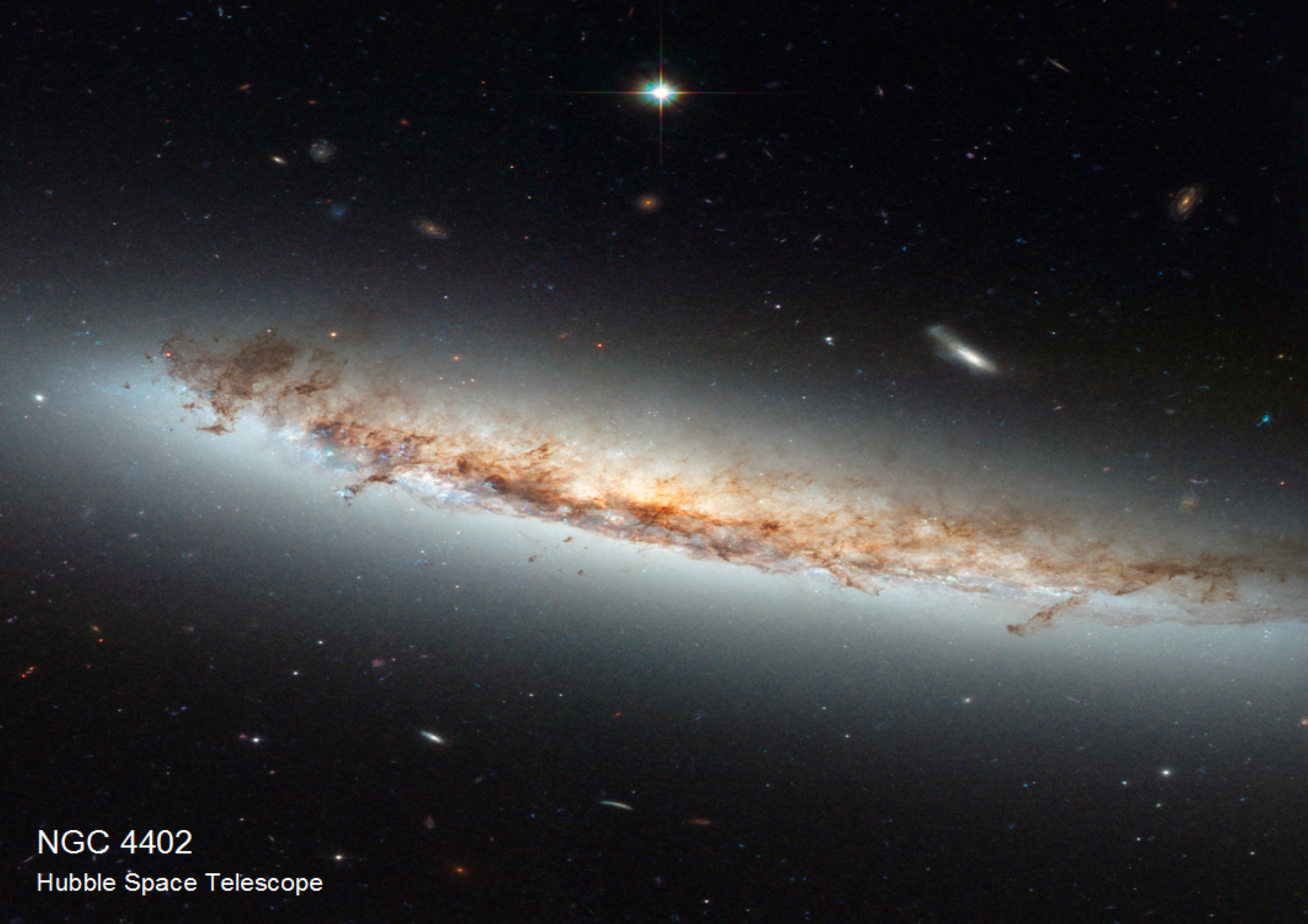
Röntgen Emission von ESO 137-002
Sun et al 2010



Radio Kontinuum Emission bei 1400 MHz von
CGCG 97-073
Boselli & Gavazzi 2006



Kenney & Koopmann (1999)



NGC 4402

Hubble Space Telescope

Simulationen

- Auf 2D beschränkt
- 100 kpc x 100 kpc
- Variierende Parameter
 - ICM
 - Galaxie

Parameter

- ICM

Homogenes ICM im Ruhezustand

Zustand der Dichte & Temperatur:		
Zentrum	bis	Randgebiet
10^{-2} cm^{-3}		10^{-5} cm^{-3}
10^7 K		mehrere 10^7 K

- Galaxie
 - Stellare Scheibe

Exponentielles Modell:

$$\rho(z, r) = \frac{M_{\star}}{4\pi b_{\star} a_{\star}^2} \exp\left(-\frac{r}{a_{\star}}\right) \exp\left(-\frac{|z|}{b_{\star}}\right).$$

Rödiger & Hensler (2005)

Parameter

- ICM

Sphärischer Bulge:

$$\rho_{\text{bulge}}(R) = \frac{M_{\text{bulge}}}{2\pi} \frac{R_{\text{bulge}}}{R(R + R_{\text{bulge}})},$$

- Galaxie

- Stellare Scheibe
- Bulge
- Dunkle Materie Halo
- Gasscheibe

Oberflächendichte:

$$\Sigma_{\text{gas}}(r) = \frac{\tilde{M}_{\text{gas}}}{2\pi a_{\Sigma}^2} \exp\left(-\frac{r}{a_{\Sigma}}\right),$$

Rödiger & Hensler (2005)

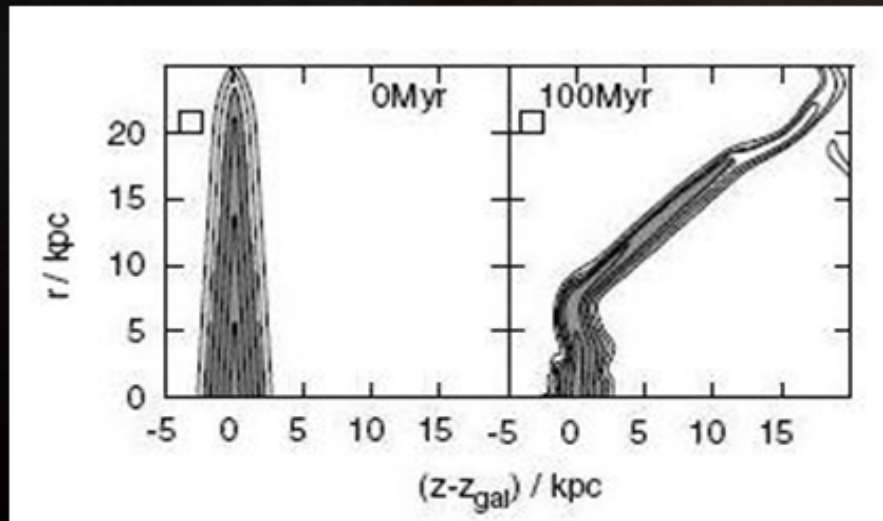
Ergebnisse

- Drei Phasen:
 - Instantaneous stripping

Einheit:

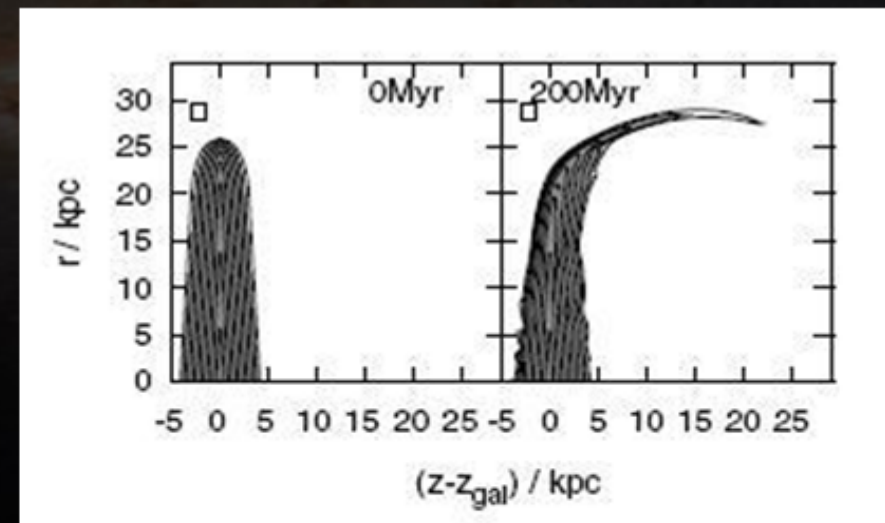
Spezifischer RP: $\text{cm}^{-3} \text{ km}^2 \text{ s}^{-2}$

Realer RP: erg cm^{-3}



1. Phase, starker ICM-Wind

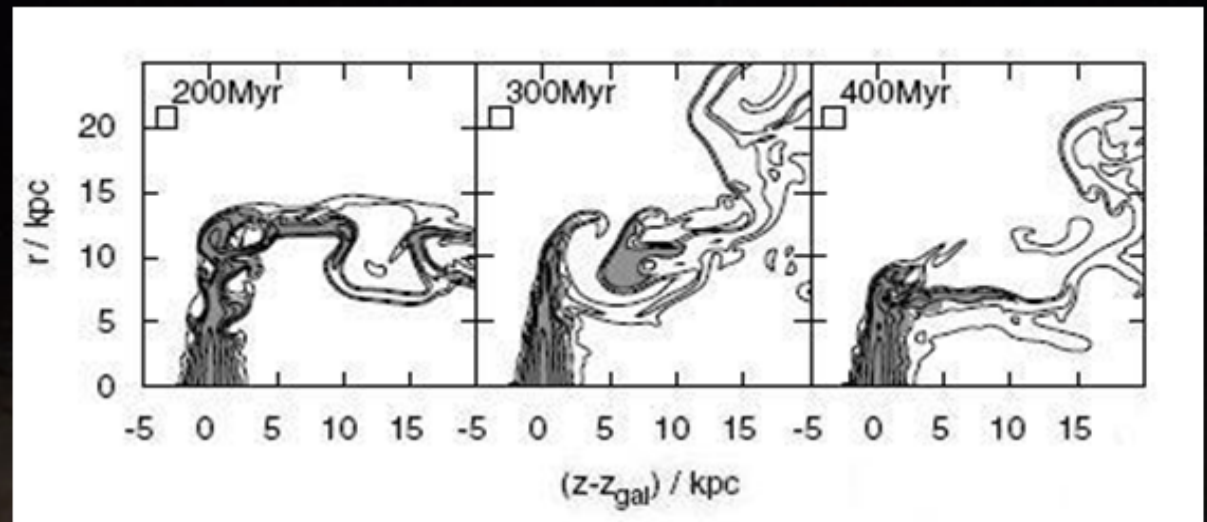
Rödiger & Hensler (2005)



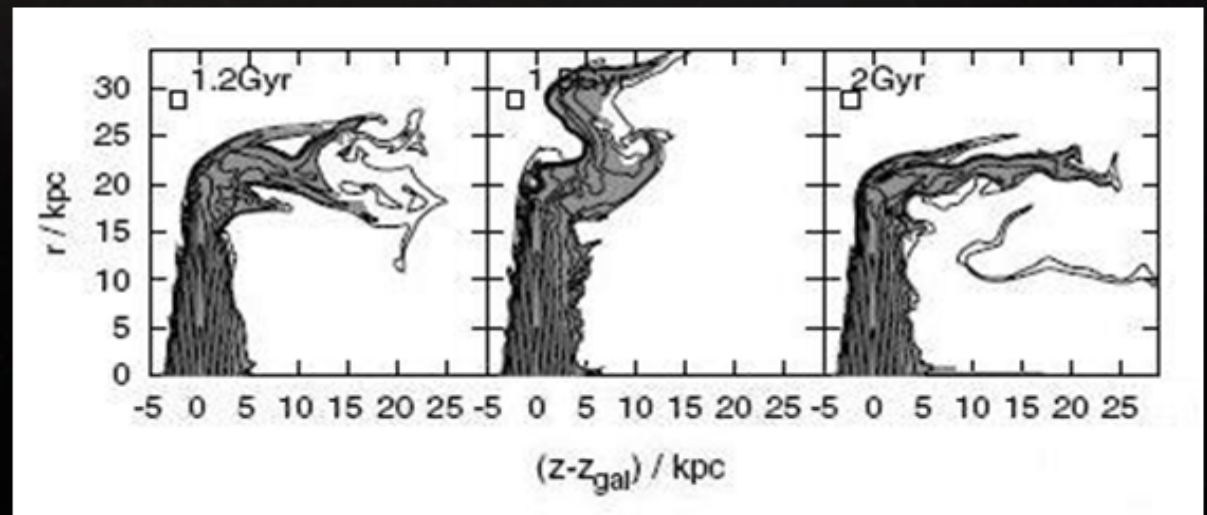
1. Phase, schwacher ICM-Wind

Ergebnisse

- Drei Phasen:
 - Instantaneous stripping
 - Intermediate phase



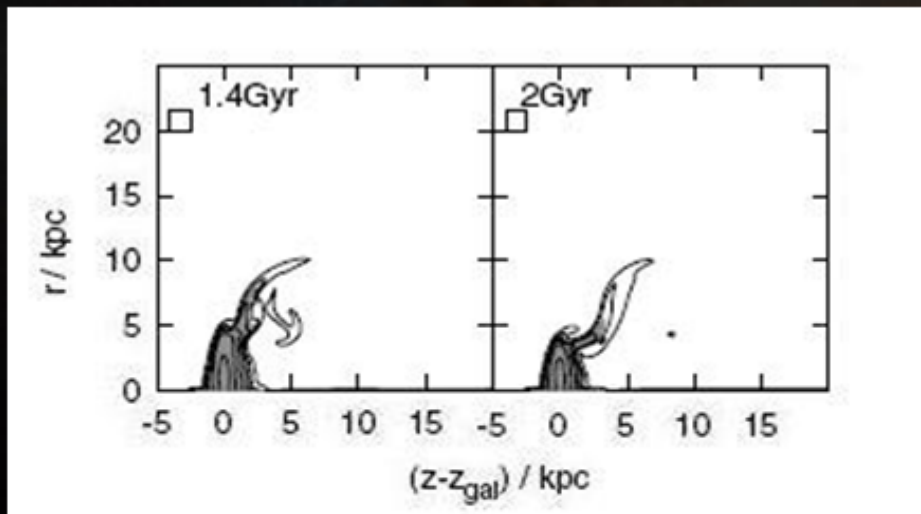
2. Phase, starker ICM-Wind



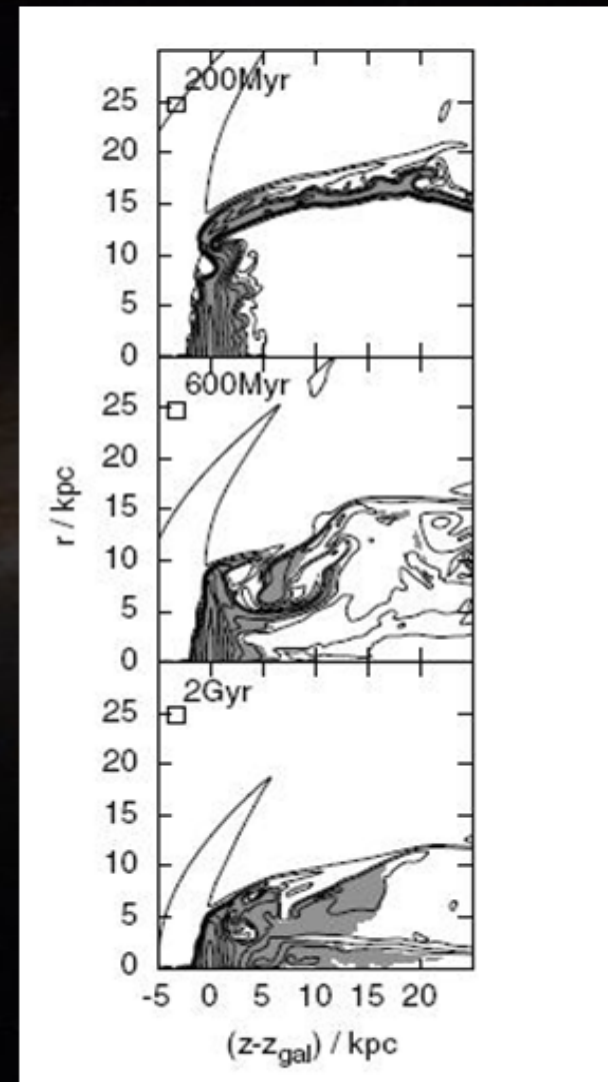
2. Phase, schwacher ICM-Wind, Rödiger & Hensler (2005)

Ergebnisse

- Drei Phasen:
 - Instantaneous stripping
 - Intermediate phase
 - Continuous stripping



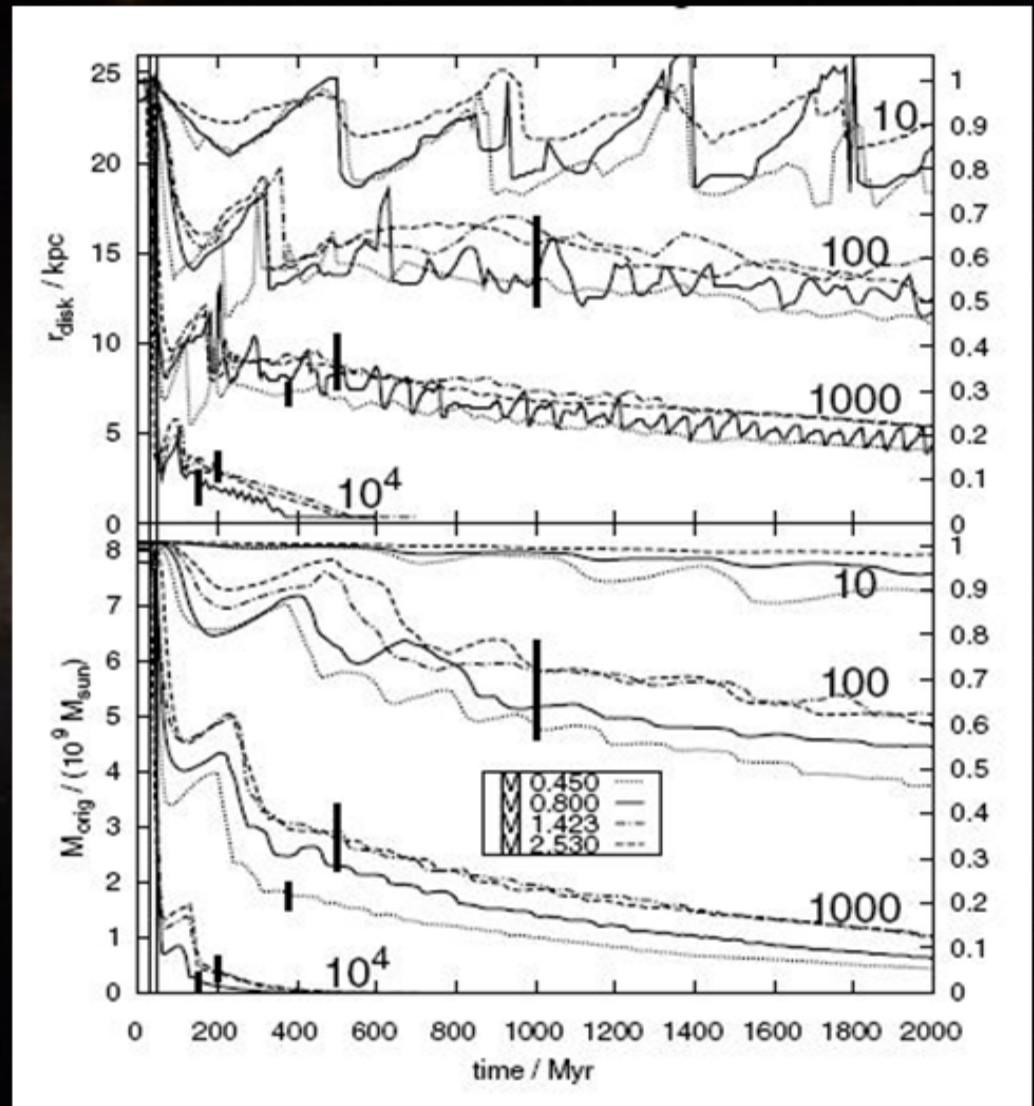
3. Phase, starker ICM-Wind, Rödiger & Hensler (2005)



starker ICM-Wind, Überschallgeschwindigkeit

Ergebnisse

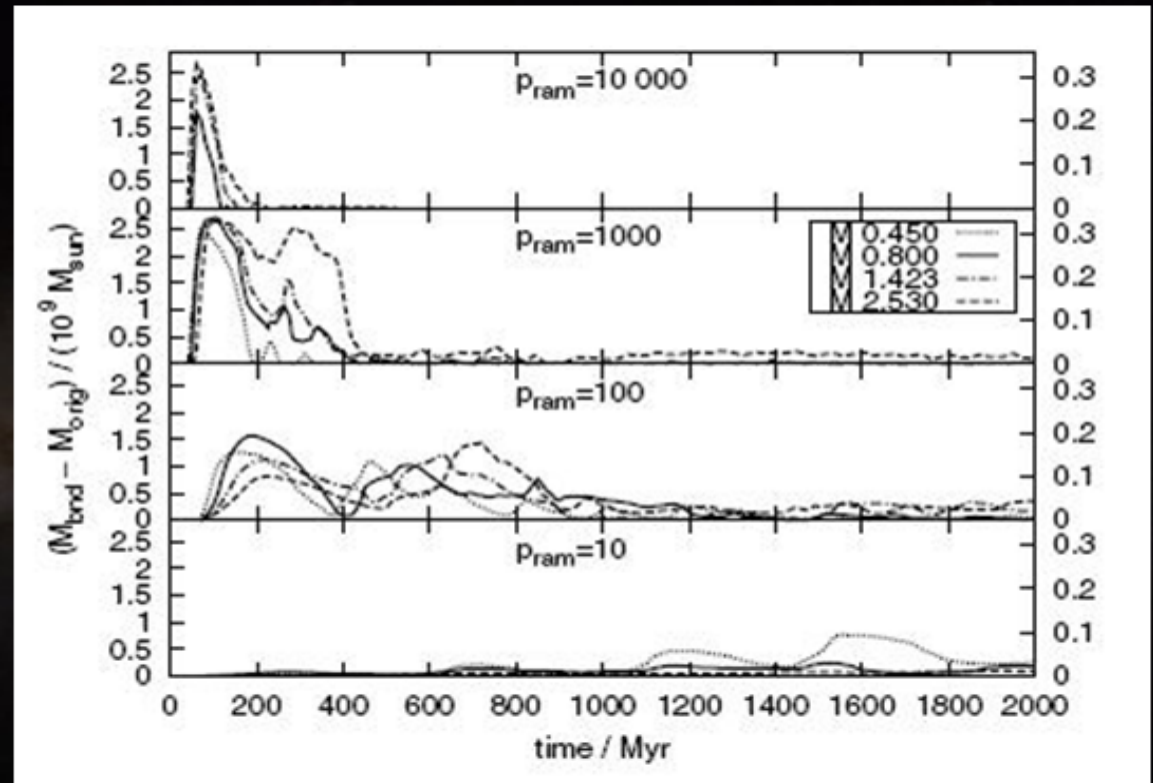
- Drei Phasen:
 - Instantaneous stripping
 - Intermediate phase
 - Continuous stripping
- Abgestreiftes Gas



Zeitliche Änderung des Radius und der Masse
Rödiger & Hensler (2005)

Ergebnisse

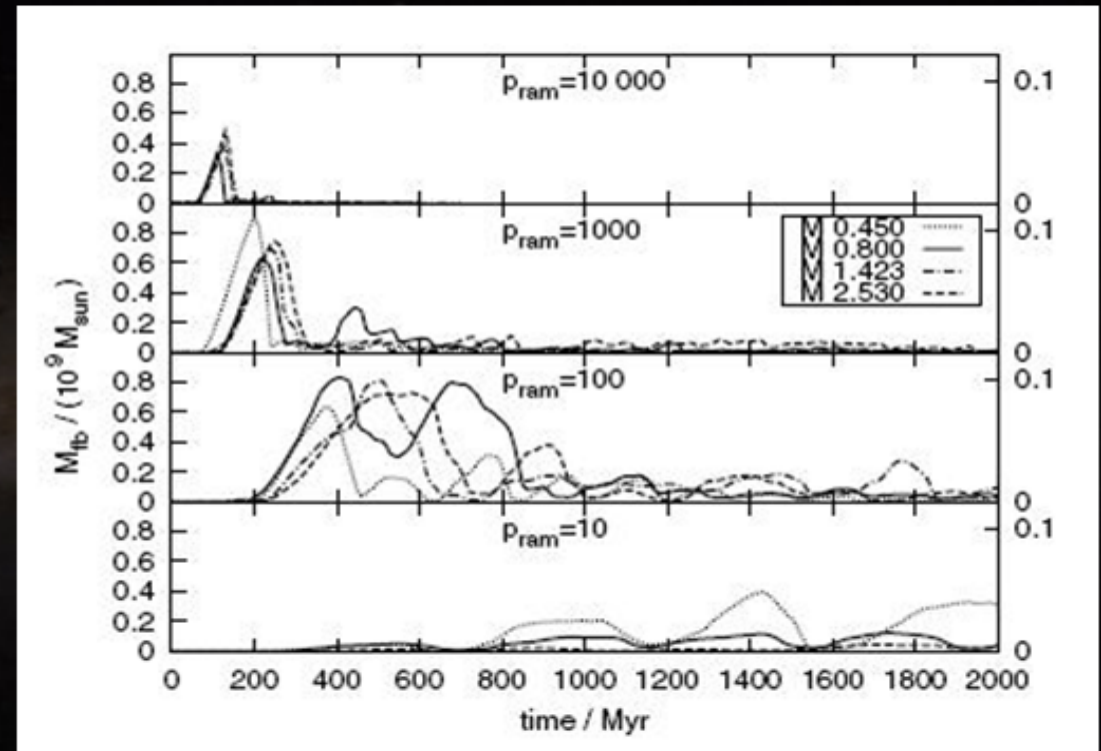
- Drei Phasen:
 - Instantaneous stripping
 - Intermediate phase
 - Continuous stripping
- Abgestreiftes Gas



Gebundenes Gas, Rödiger & Hensler (2005)

Ergebnisse

- Drei Phasen:
 - Instantaneous stripping
 - Intermediate phase
 - Continuous stripping
- Abgestreiftes Gas

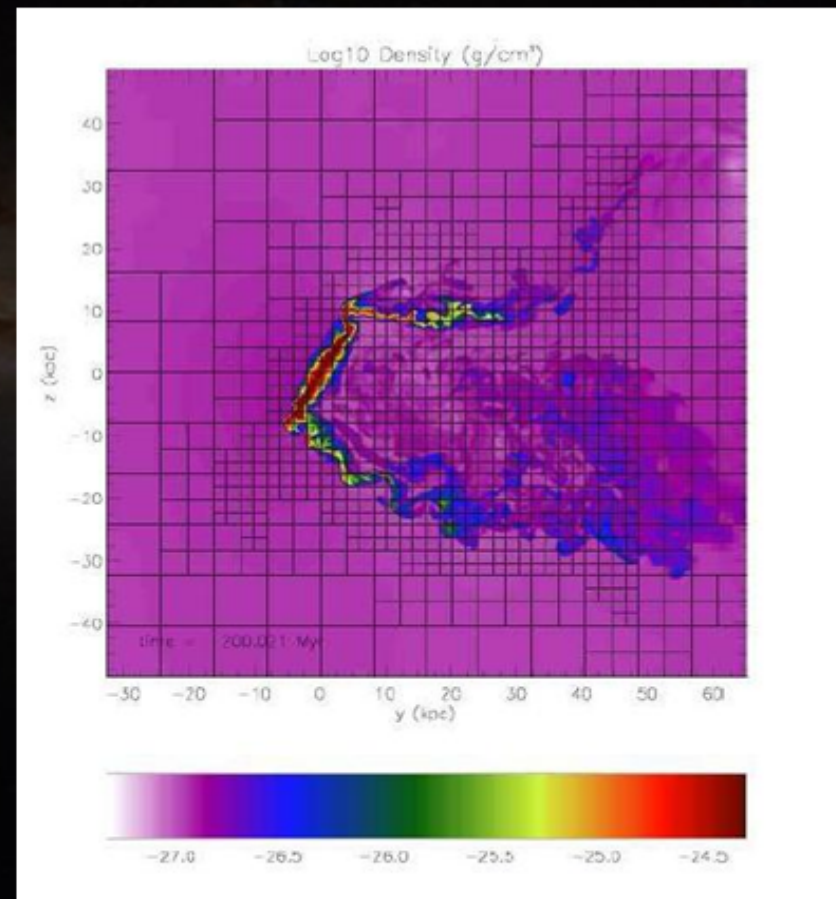


Zurück gefallenes Gas, Rödiger & Hensler (2005)

Ergebnisse

- Drei Phasen:
 - Instantaneous stripping
 - Intermediate phase
 - Continuous stripping
- Abgestreiftes Gas
- Neigung

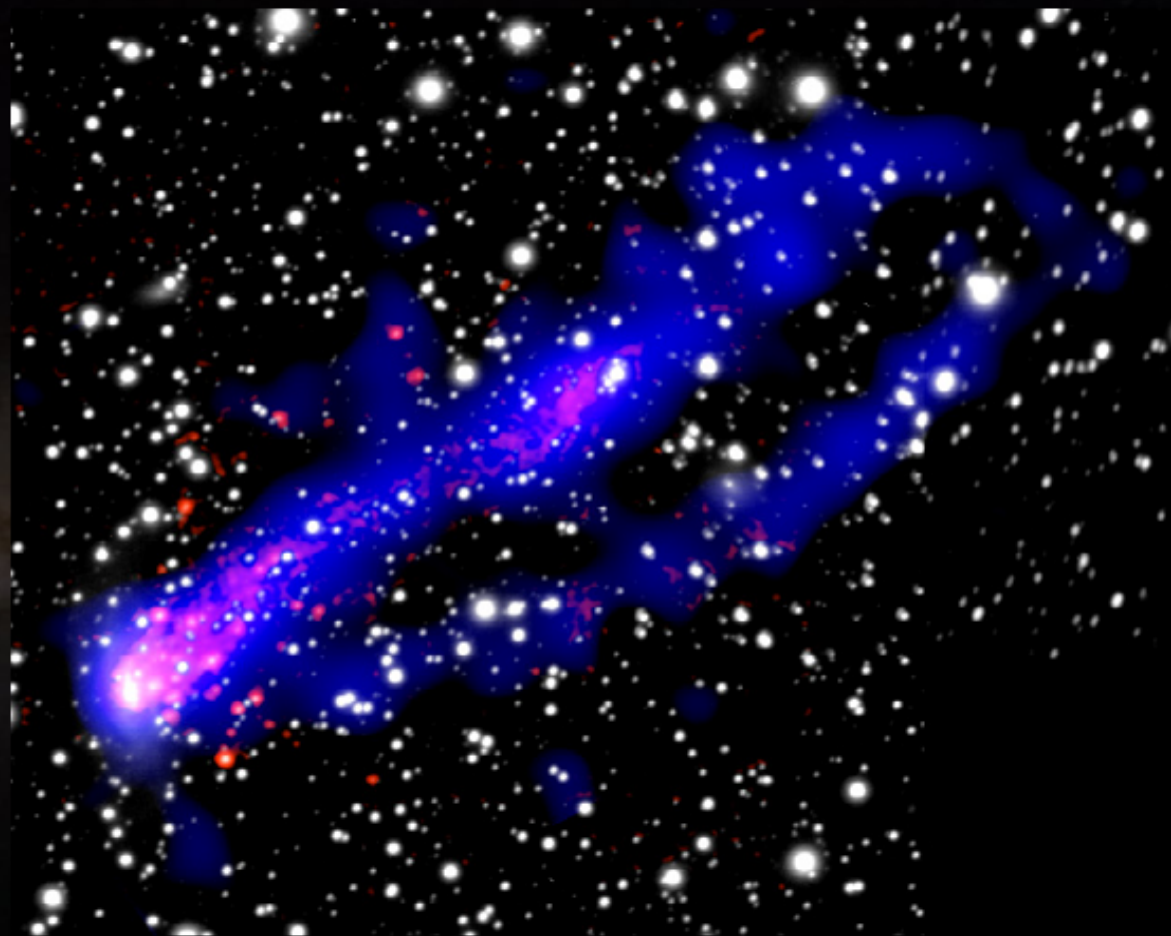
Entscheidend bei mittelstarken ICM-Winden



Rödiger & Brüggen 2005

Ergebnisse

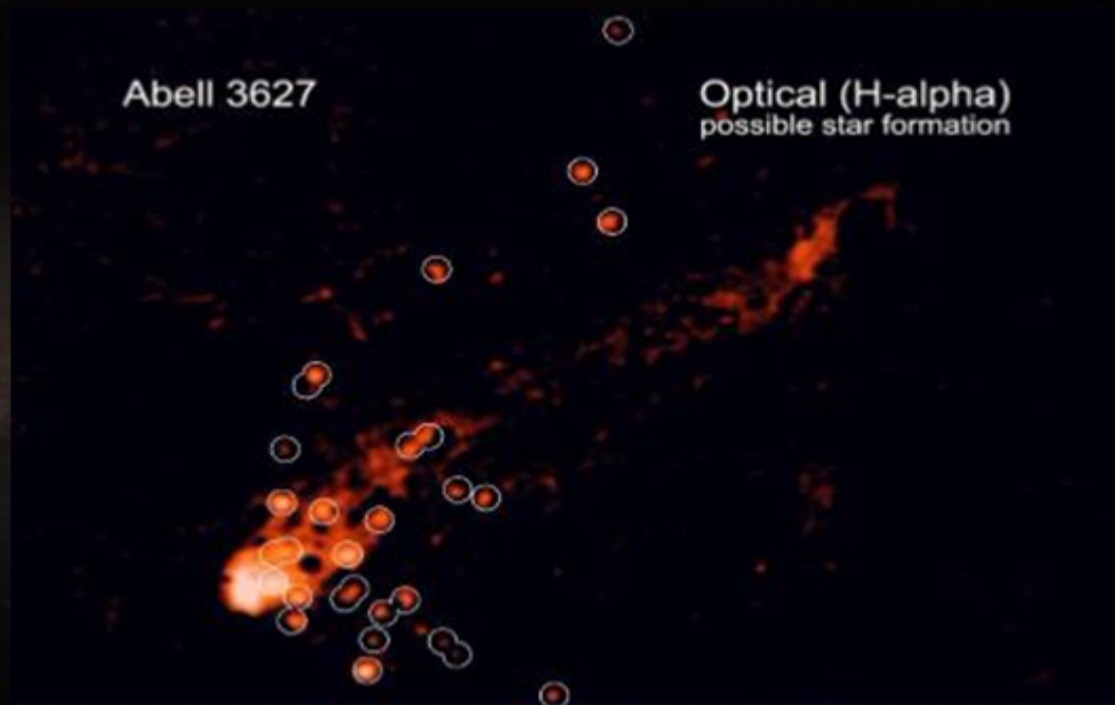
- Drei Phasen:
 - Instantaneous stripping
 - Intermediate phase
 - Continuous stripping
- Abgestreiftes Gas
- Neigung
- Sternentstehung?



ESO 137-001 im Röntgenbereich, Sun et al 2010

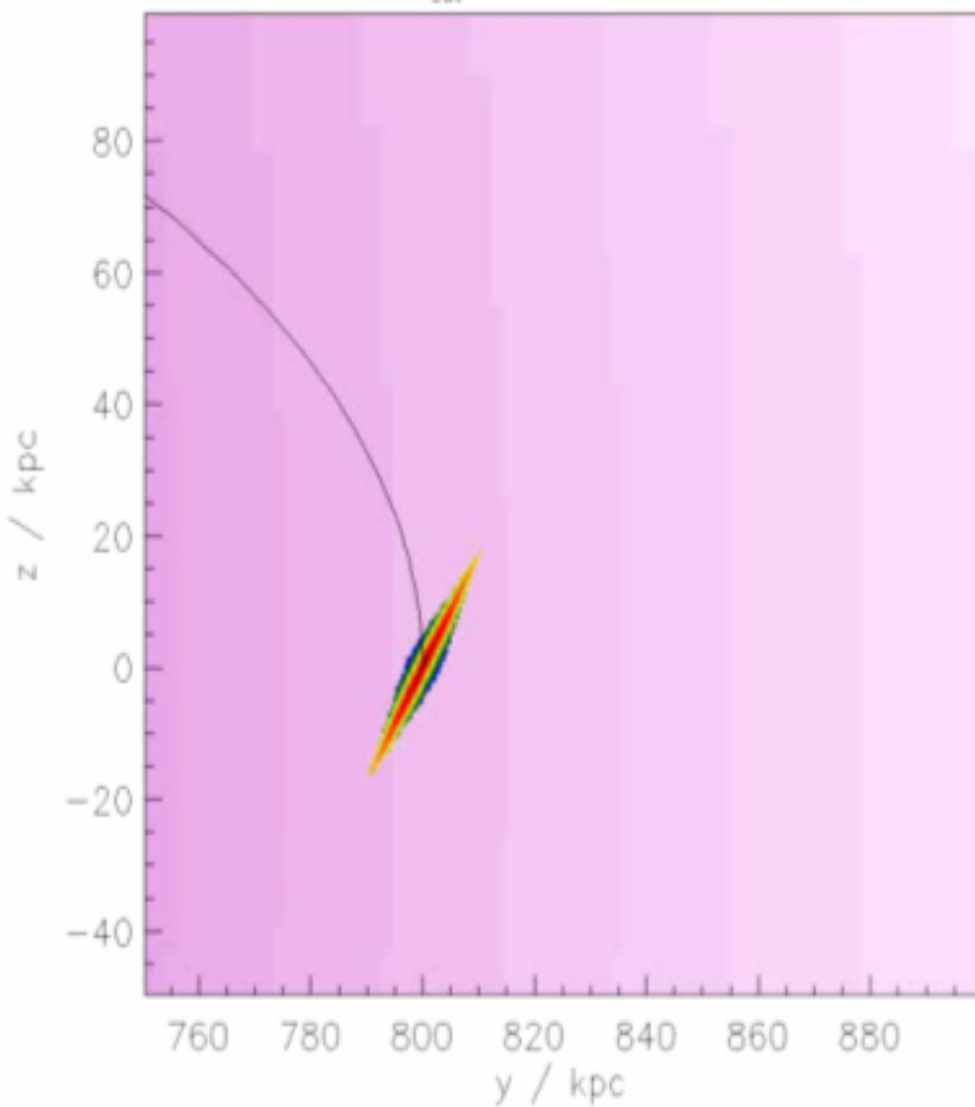
Ergebnisse

- Drei Phasen:
 - Instantaneous stripping
 - Intermediate phase
 - Continuous stripping
- Abgestreiftes Gas
- Neigung
- Sternentstehung?

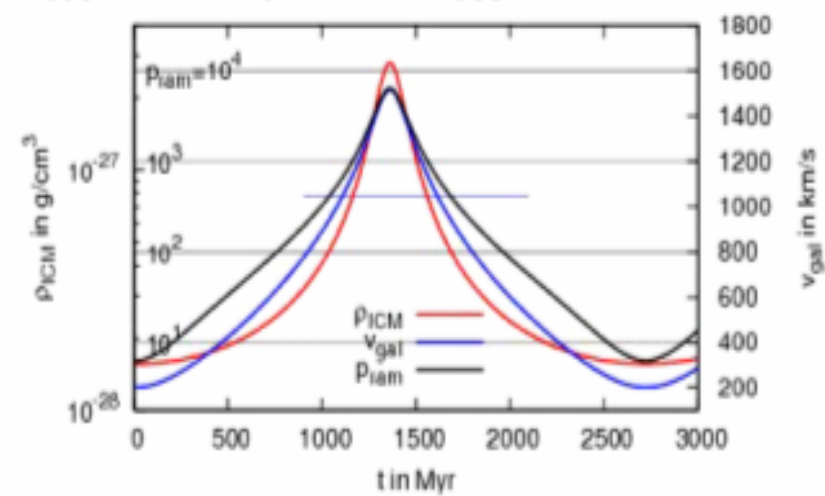
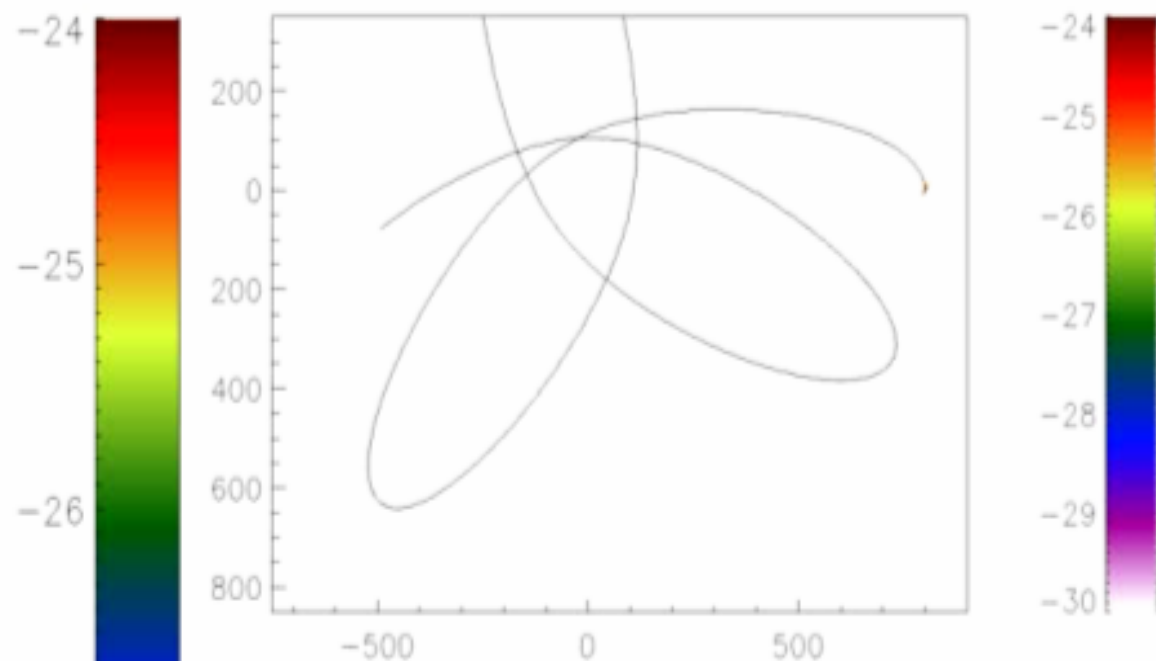


ESO 137-001, Scientificblogging.com

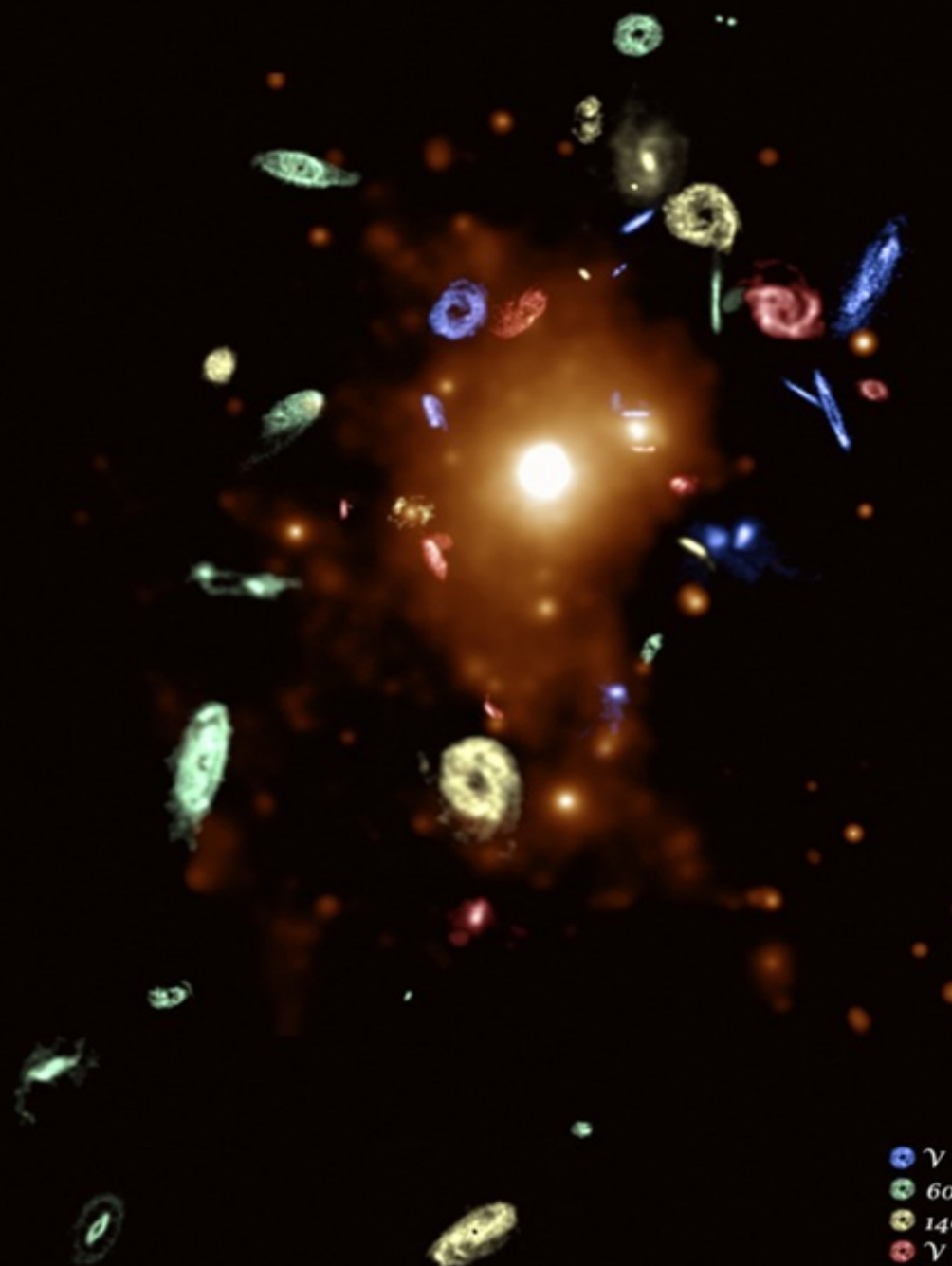
$\log_{10}(\rho / \text{g cm}^{-3})$ $x_{\text{cut}} = 0.00000 \text{ kpc}$ $t = 0 \text{ Myr}$



$\log_{10}(\rho_{\text{ISM}} / \text{cm}^{-3})$ $x_{\text{cut}} = 0.00000 \text{ kpc}$ $t = 0 \text{ Myr}$

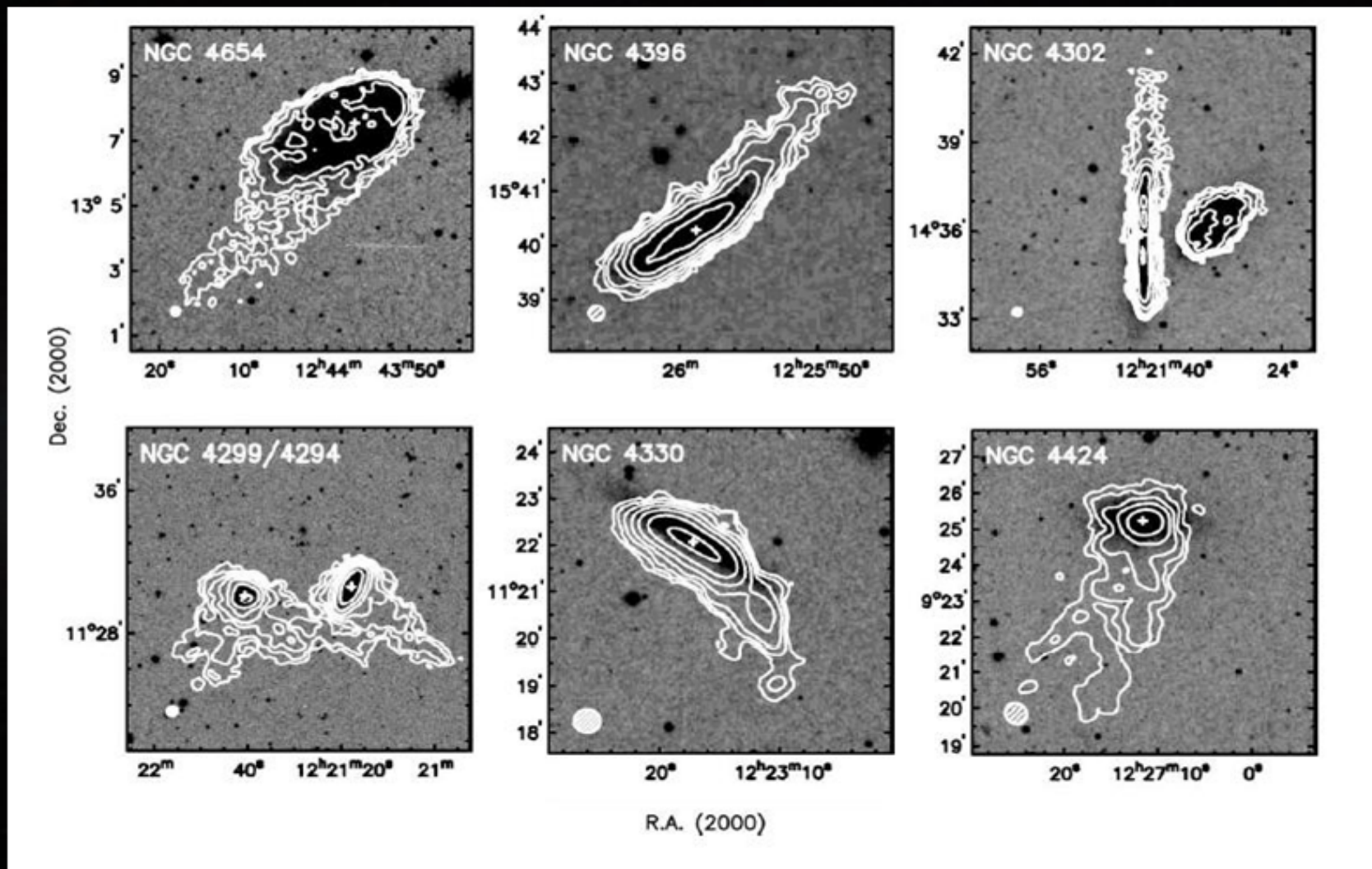


Virgo, A Laboratory for Studying Galaxy Evolution



- $V < 500 \text{ km/s}$
- $600 \text{ km/s} < V < 1300 \text{ km/s}$
- $1400 \text{ km/s} < V < 2000 \text{ km/s}$
- $V > 2000 \text{ km/s}$

Galaxien im Virgo Haufen



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- Rödiger & Brüggen (2005)
- Böhringer et al. (1994)
- Binney & Tremaine (1987)
- Vollmer et al. (2001)

- <http://www.faculty.iu-bremen.de/eroediger>
- <http://www.sciencedaily.com>
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