



**Bumhyun Lee**

**Yonsei University**

**Q. What's the title of this movie?**

~~**ARMAGEDDON**~~

OCEANS RISE. CITIES FALL.  
**HOPE SURVIVES.**

"EXHILARATING!  
THE SPECIAL EFFECTS  
HIGHLIGHT OF THE YEAR."

-Jeffrey Lyons, NBC-TV

# DEEP **IMPACT**

PARAMOUNT PICTURES and WOLFGANG PETERSON present a LUCASFILM LTD. production a WOLFGANG PETERSON film "DEEP IMPACT"  
ROBERT DUVALL TEA LEONNI ELLIAR WOOD VANESSA REDGRANE MAXIMILIAN SCHELL and MORGAN FREEMAN  
"DEEP IMPACT" CASTING BY JILL KAPLAN COSTUME DESIGNER JILL KAPLAN MUSIC BY JAMES NEWTON HOWARD EDITOR JAMES NEWTON HOWARD PRODUCTION DESIGNER JAMES NEWTON HOWARD EXECUTIVE PRODUCERS JAMES NEWTON HOWARD AND JAMES NEWTON HOWARD PRODUCED BY JAMES NEWTON HOWARD AND JAMES NEWTON HOWARD WRITTEN BY JAMES NEWTON HOWARD AND JAMES NEWTON HOWARD DIRECTED BY WOLFGANG PETERSON  
www.paramount.com/deepimpact  
© 1998 WOLFGANG PETERSON LTD. ALL RIGHTS RESERVED. WOLFGANG PETERSON LTD. IS A REGISTERED TRADEMARK OF WOLFGANG PETERSON LTD. WOLFGANG PETERSON LTD. IS A REGISTERED TRADEMARK OF WOLFGANG PETERSON LTD. WOLFGANG PETERSON LTD. IS A REGISTERED TRADEMARK OF WOLFGANG PETERSON LTD.

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# DEEP IMPACT:

THE DESTINY OF MOLECULAR GAS  
UNDER STRONG RAM PRESSURE

✓ ICM BOMBARDS A GALAXY

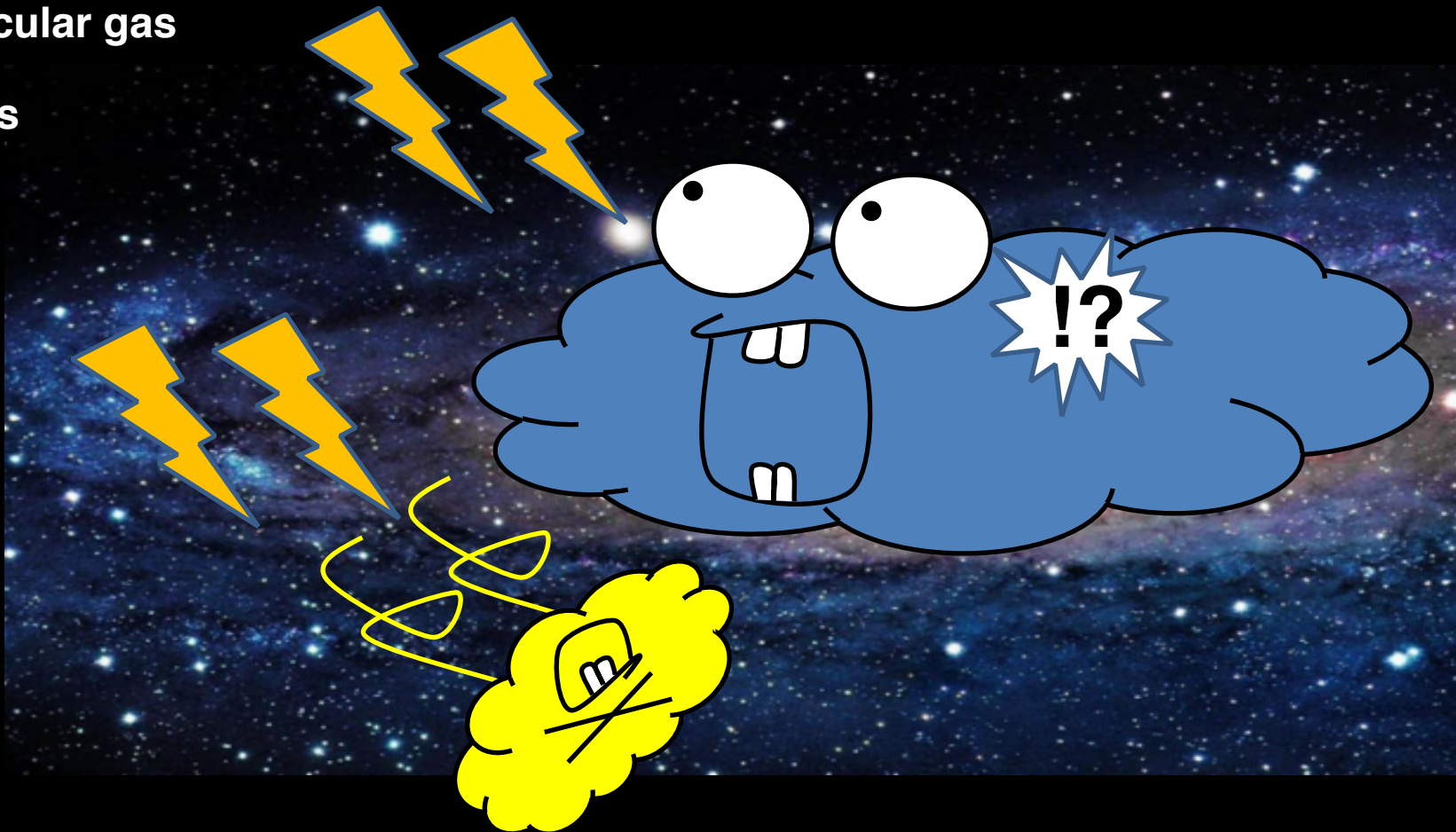
✓ HI GAS IS STRIPPED

✓ MOLECULAR GAS SURVIVES?

 Molecular gas

 HI gas

 ICM





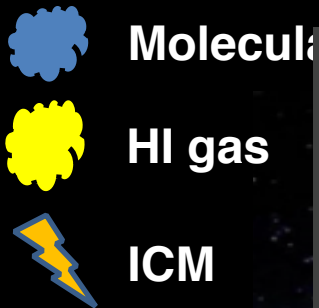
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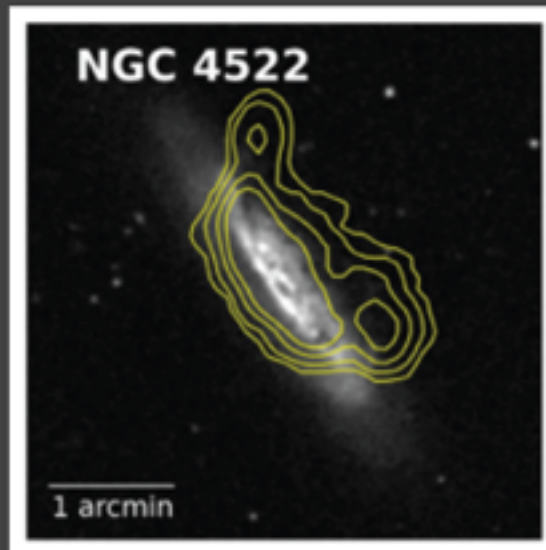
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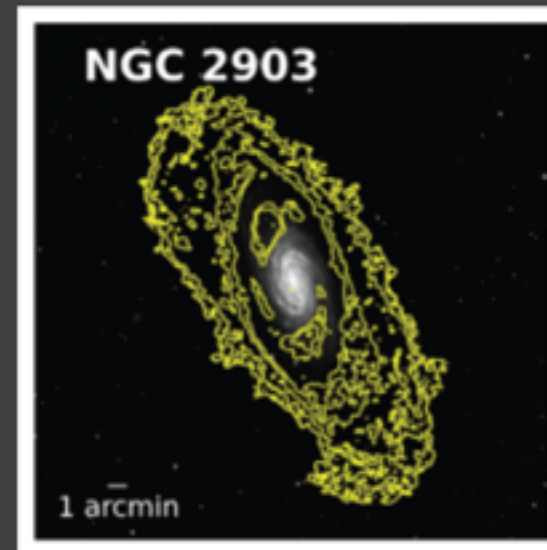


Cluster spiral



Chung et al. 2009

Field spiral



Walter et al. 2008

Yellow contours: HI gas  
Grey scale: the stellar disk

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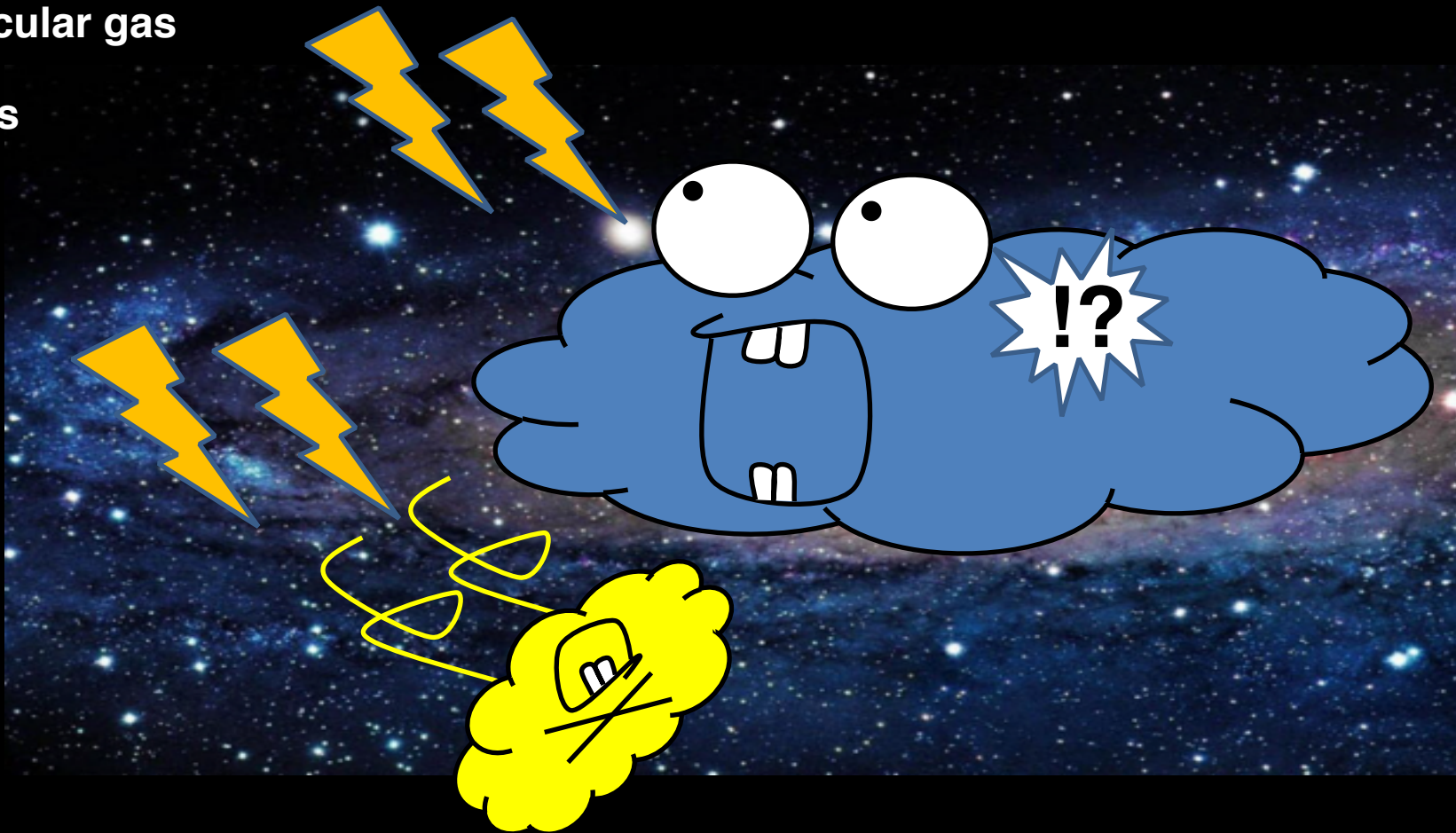
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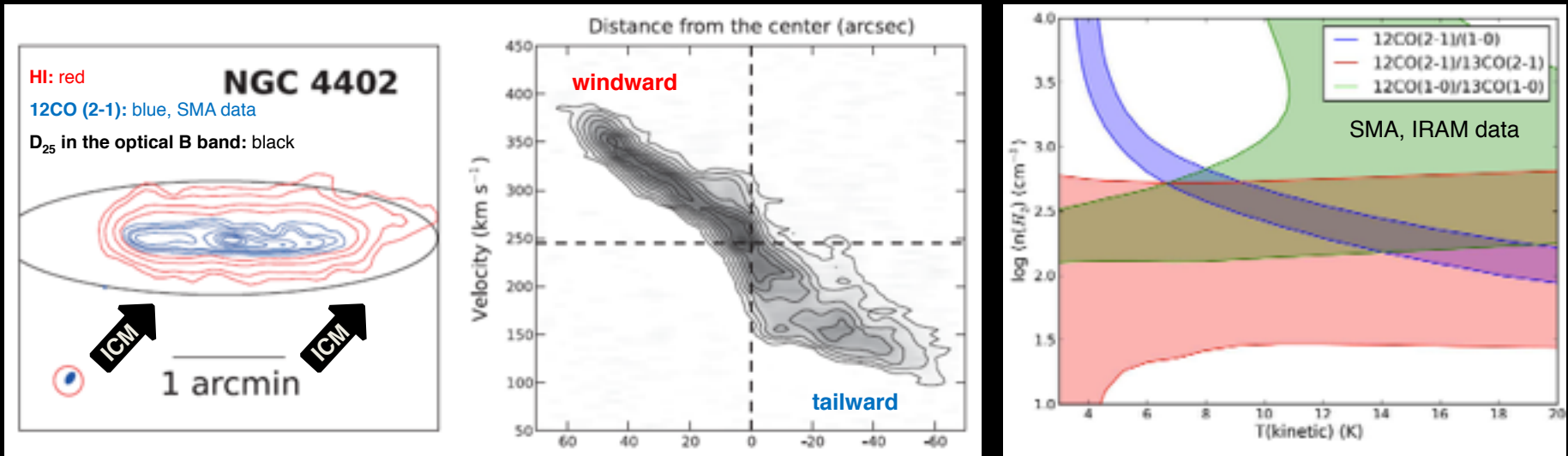
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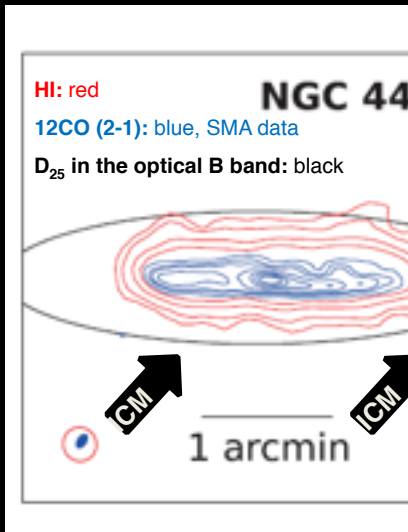
# Molecular gas properties under strong ram pressure



Detailed molecular gas properties (morphology, kinematics, surface density...) of Virgo spiral, caught in various ram pressure stripping stages

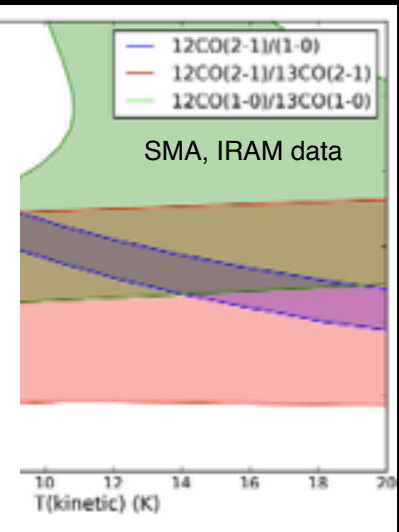
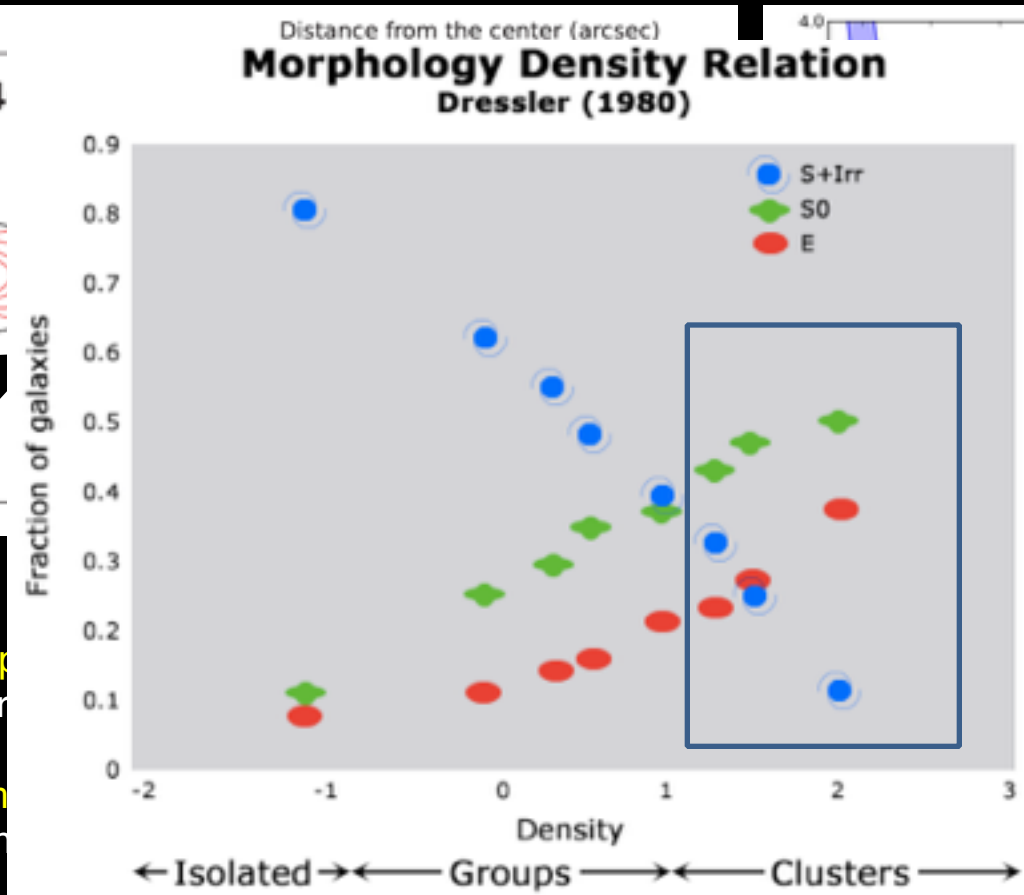
Physical properties (temperature, density, ...) of molecular gas using non-LTE model and multiple CO transitions

# Molecular gas properties under strong ram pressure



Detailed molecular gas properties caught in various ram pressure

Physical properties (temperature) using non-LTE model and



spiral,

✓ **Star formation and galaxy evolution in the cluster environment**