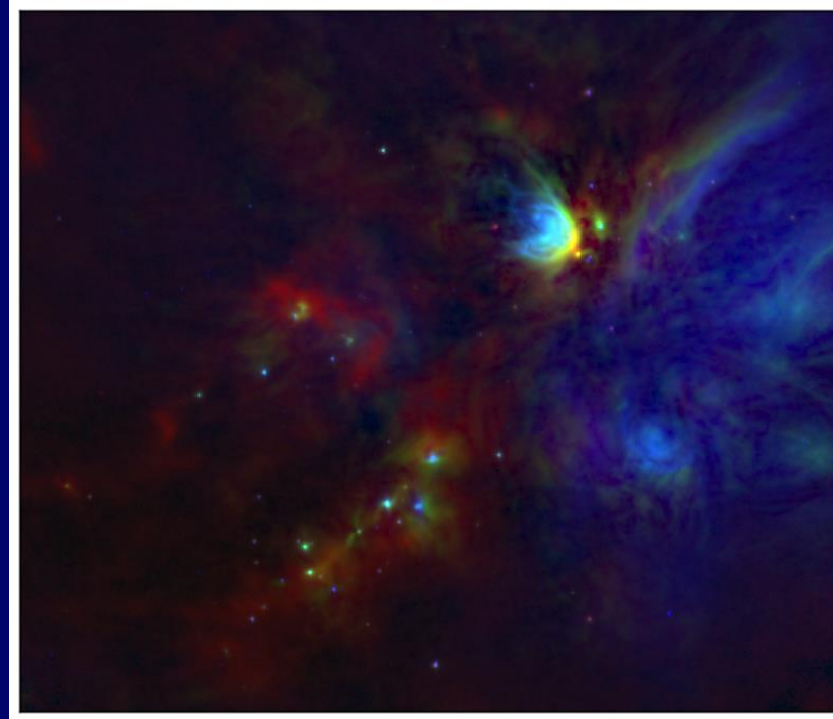
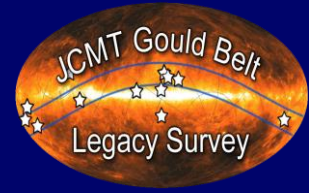


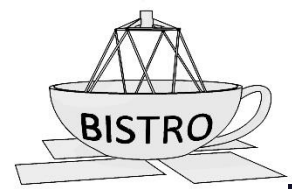
# The effect of the magnetic field locally on gas in the Milky Way Galaxy



Pattle et al., 2015,  
MNRAS, 450, 1094

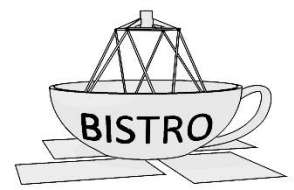
Derek Ward-Thompson  
Jeremiah Horrocks Institute, University of Central Lancashire

*Gas in Galaxies Meeting, Malta, 2017 October 3<sup>rd</sup>*

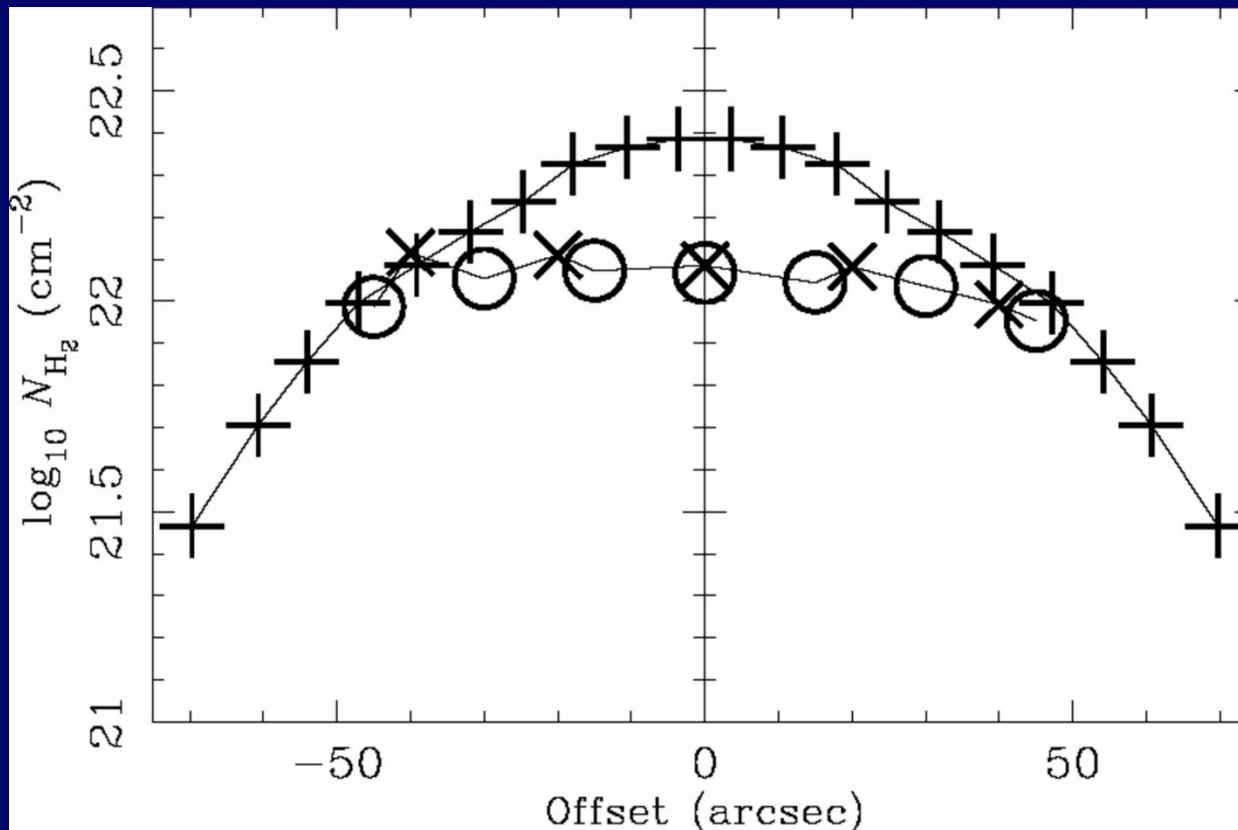


Optical image (Wilking 2003) –  $\sim 4.5 \times 4.5$  deg

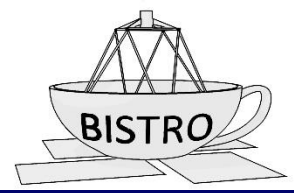




# Molecular gas freeze-out



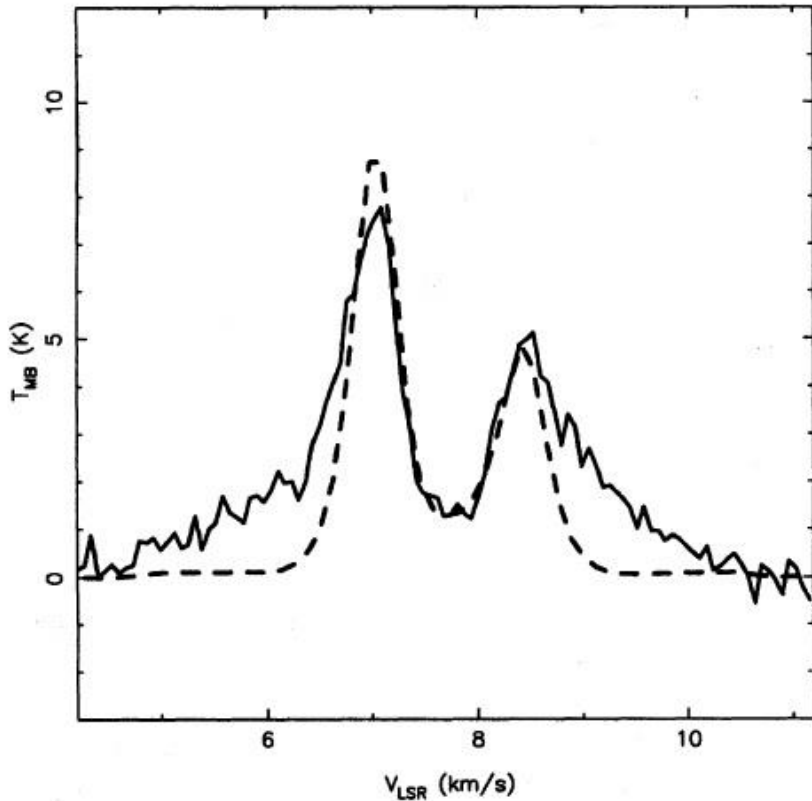
X = C17O, 0 = C18O, + = 850um dust  
(Redman et al 2002 MNRAS 337, L17)



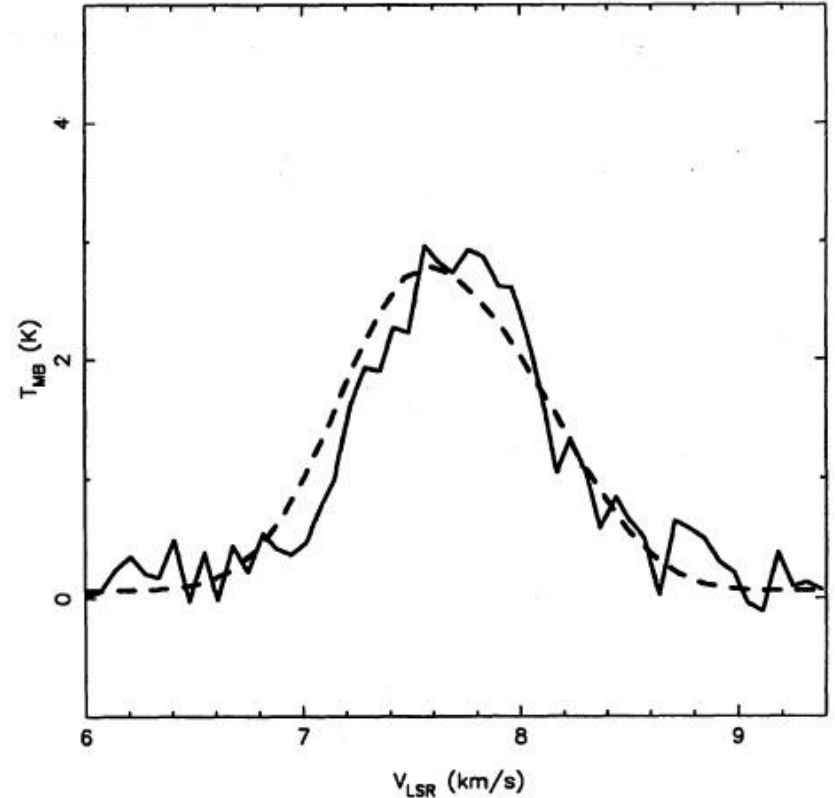
# Ions freeze out less(?)



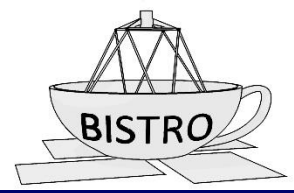
(a) HCO+ (4-3)



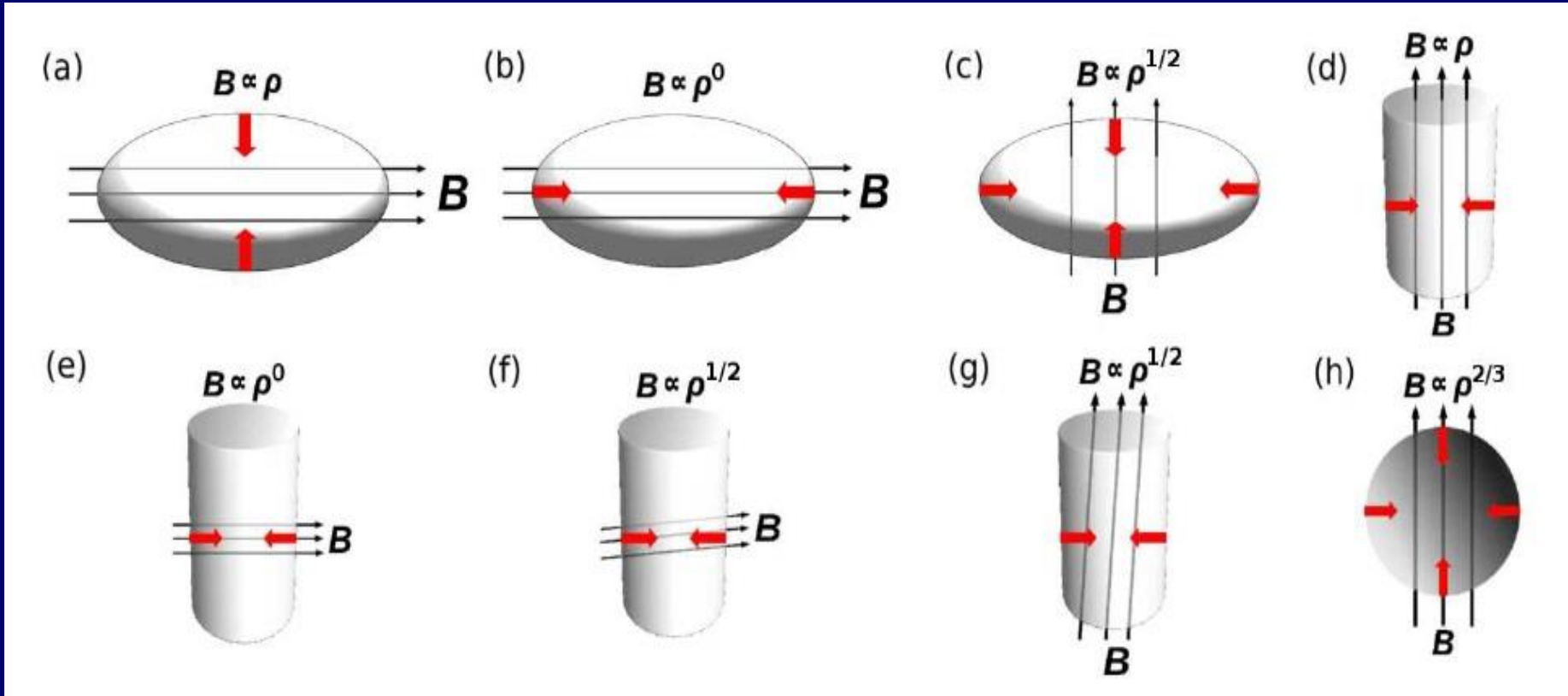
(b) H<sup>13</sup>CO+ (4-3)



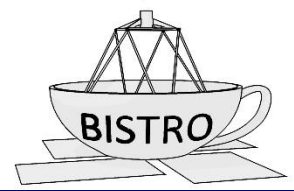
Ward-Thompson et al. 1996, MNRAS 281, L53



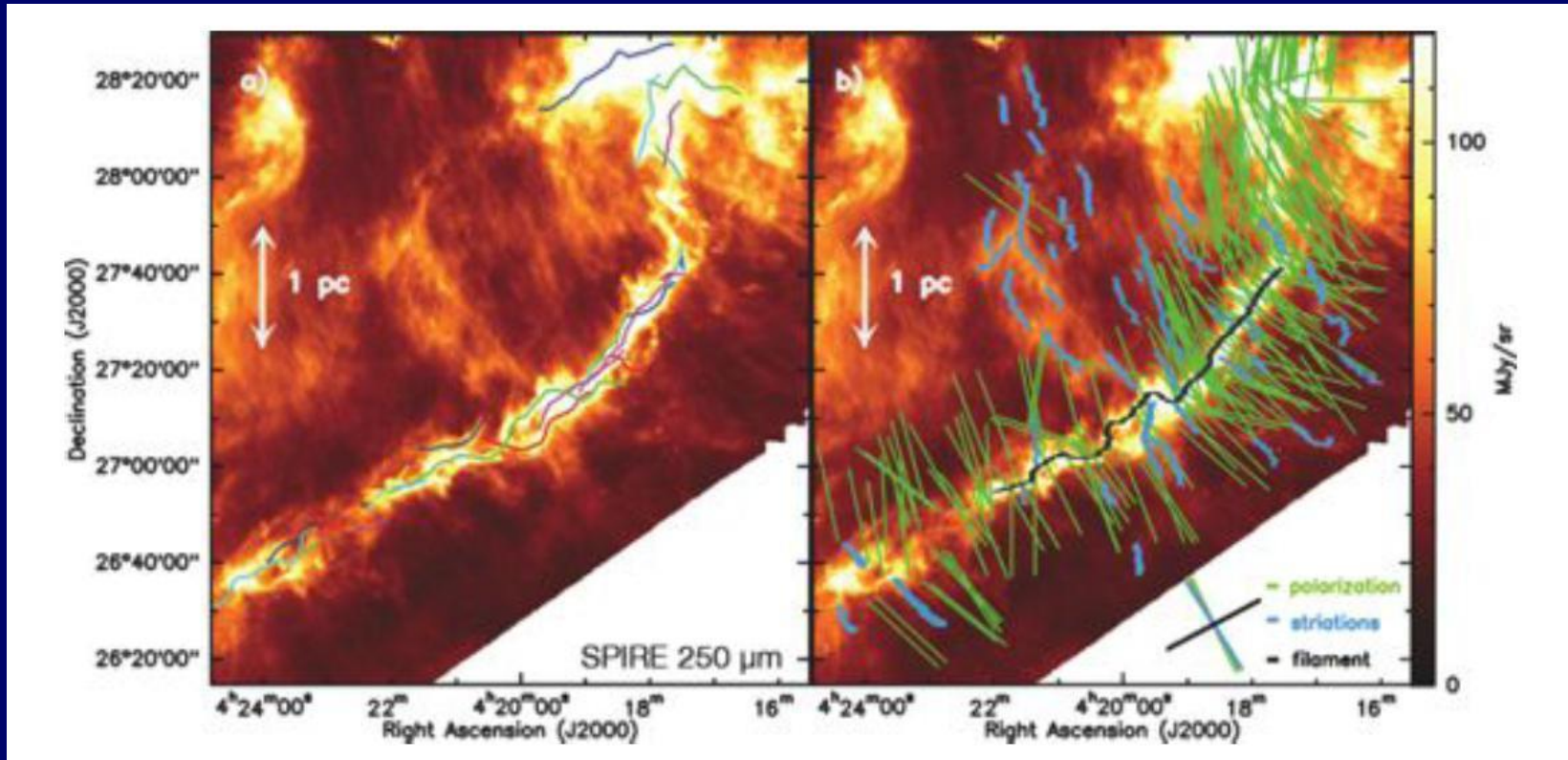
# Affects how well gas couples to B-field



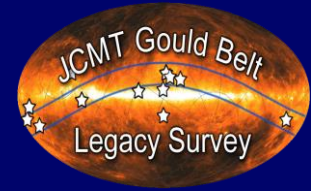
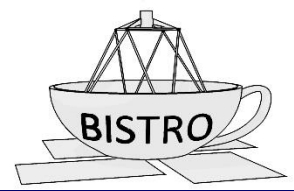
Tritsis et al 2015 MNRAS 451, 4384



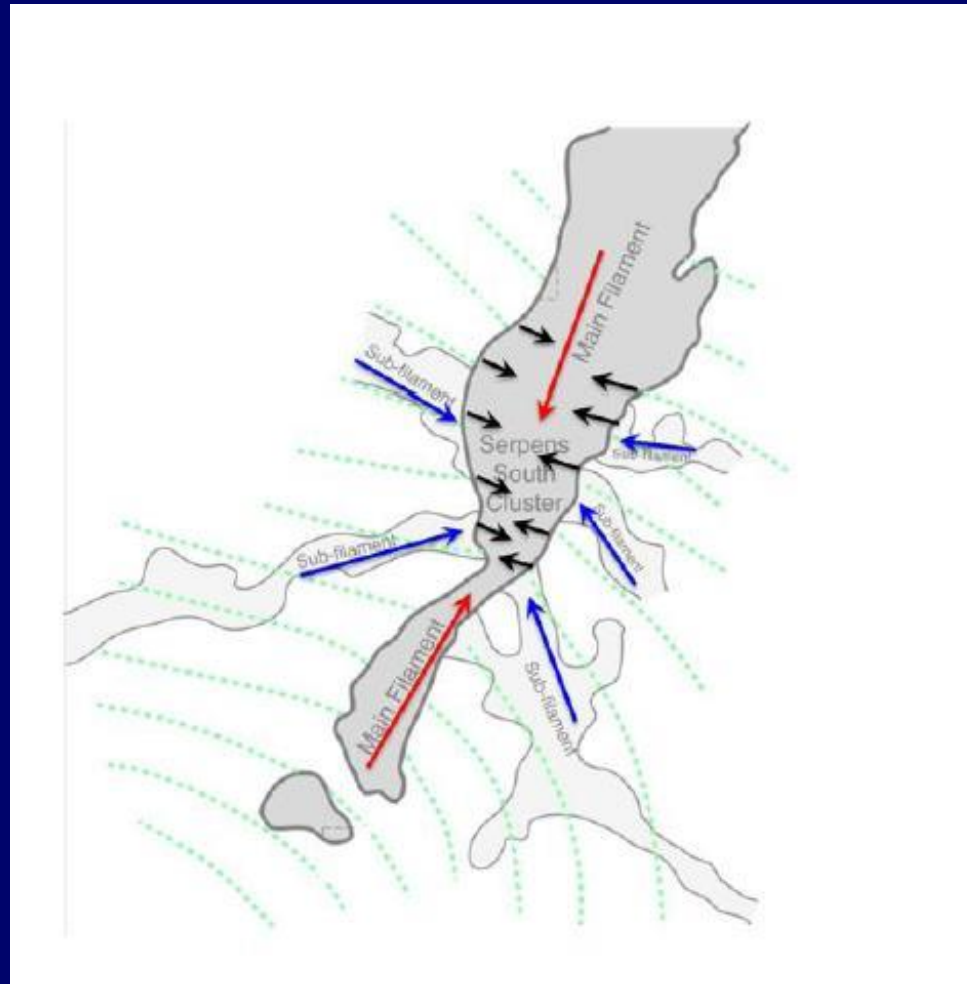
# Filament growth



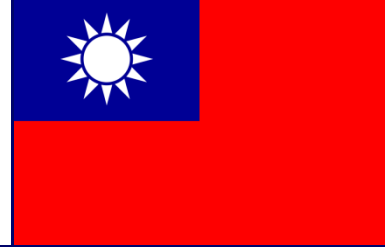
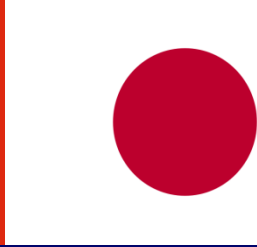
Palmeirim et al., 2013, A&A, 550, A38



# Cores form on filaments



Andre et al., 2014,  
PPVI, pp.27-51



**Pierre Bastien**  
 Mike Chen  
 Simon Coude  
 James Di Francesco  
 Jason Fiege  
 Rachel Friesen  
 Martin Houde  
 Doug Johnstone  
 Kevin Lacaille  
 Brenda Matthews  
 Andy Pon  
 Gerald Schieven

Dalei Li  
 Di Li  
 Hua-Bai Li  
 Hong-Li Liu  
 Junhao Liu  
 Lei Qian  
 Keping Qiu  
 Hongchi Wang  
 Jinghua Yuan  
 Chuan-Peng Zhang  
 Guoyin Zhang  
 Jianjun Zhou  
 Lei Zhu

Yusuke Aso  
 Yasuo Doi  
 Ray Furuya  
 Tetsuo Hasegawa  
 Saeko Hayashi  
 Tsuyoshi Inoue  
 Shu-ichiro Inutsuka  
 Kazunari Iwasaki  
 Koji Kawabata  
 Jungmi Kwon  
 Masafumi Matsumura  
 Fumitaka Nakamura  
 Hiroyuki Nakanishi  
 Quang Nguyen-Luong  
 Nagayoshi Ohashi  
 Takashi Onaka  
 Tae-Soo Pyo  
 Hiroko Shinnaga  
 Motohide Tamura  
 Kohji Tomisaka

Do-Young Byun  
 Jungyeon Cho  
 Minhoo Choi  
 Eun Jung Chung  
 Il-Gyo Jeong  
 Ji-hyun Kang  
 Miju Kang  
 Sung-ju Kang  
 Gwanjeong Kim  
 Jongsoo Kim  
 Kee-Tae Kim  
 Kyoung Hee Kim  
 Shinyoung Kim  
 Woojin Kwon  
 Chang Won Lee  
 Jeong-Eun Lee  
 Sang-Sung Lee  
 Tie Liu  
 ARan Lyo  
 Archana Soam

Vivien Chen  
 Wen Ping Chen  
 Tao-Chung Ching  
 Chakali Eswaraiah  
 Ciska Kemper  
 Patrick Koch  
 Shih-Ping Lai  
 Sheng-Yuan Liu  
 Ramprasad Rao  
 Ya-Wen Tang  
 Jia-Wei Wang  
 Hsi-Wei Yen



Antonio Chrysostomou  
 Emily Drabek-Maunders  
 Stewart Eyres  
 Gary Fuller  
 Tim Gledhill  
 Jane Greaves  
 Matt Griffin  
 Jennifer Hatchell

Wayne Holland  
 Jason Kirk  
 Kate Pattle  
 Nicolas Peretto  
 John Richer,  
 Andrew Rigby  
 Jean-Francois Robitaille  
 Giorgio Savini,  
 Anna Scaife  
 Derek Ward-Thompson  
 Anthony Whitworth



David Berry  
 Per Friberg  
 Sarah Graves



Sam Falle  
 Sven van Loo  
 Joe Mottram  
 Sarah Sadavoy  
 Yusuke Tsukamoto

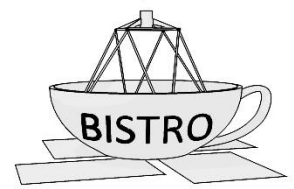


David Berry  
 Per Friberg  
 Sarah Graves

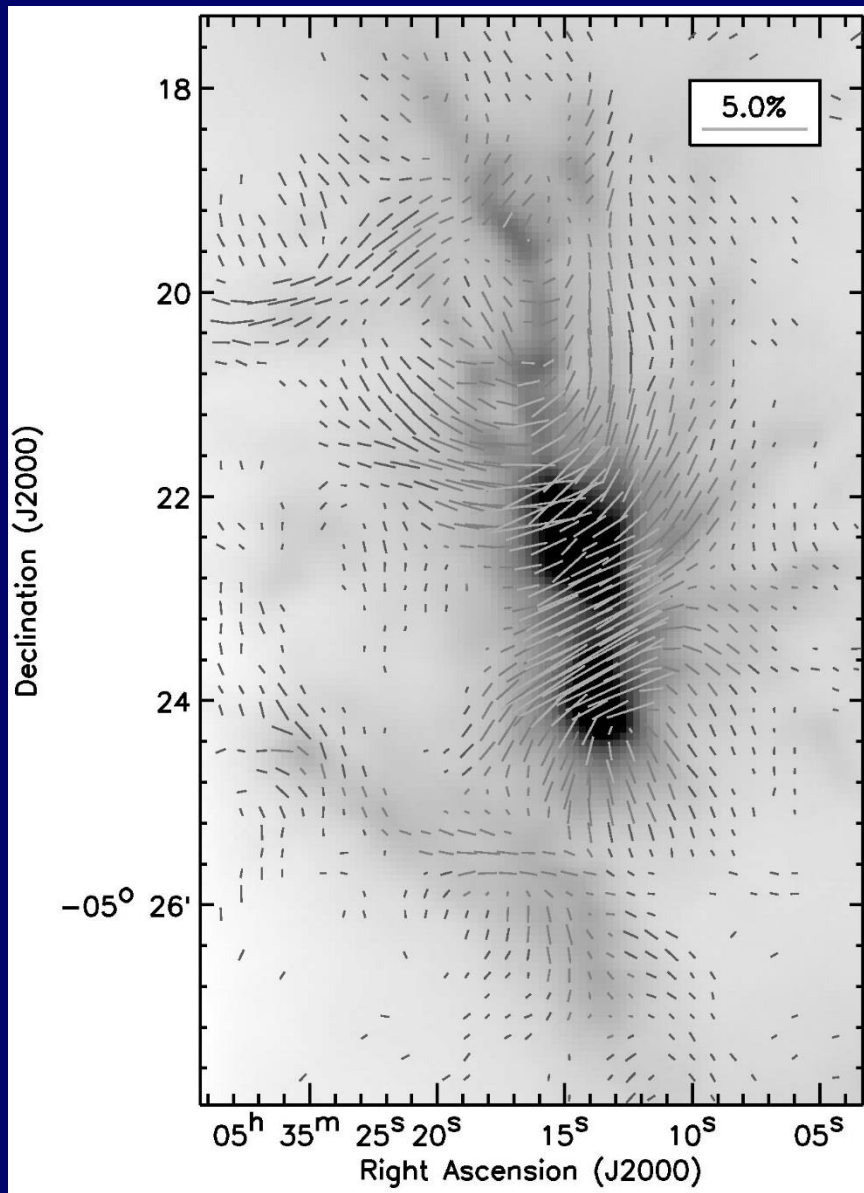
Harriett Parsons  
 Mark Rawlings



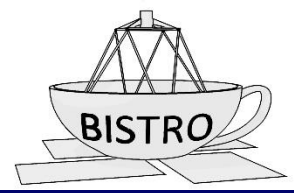




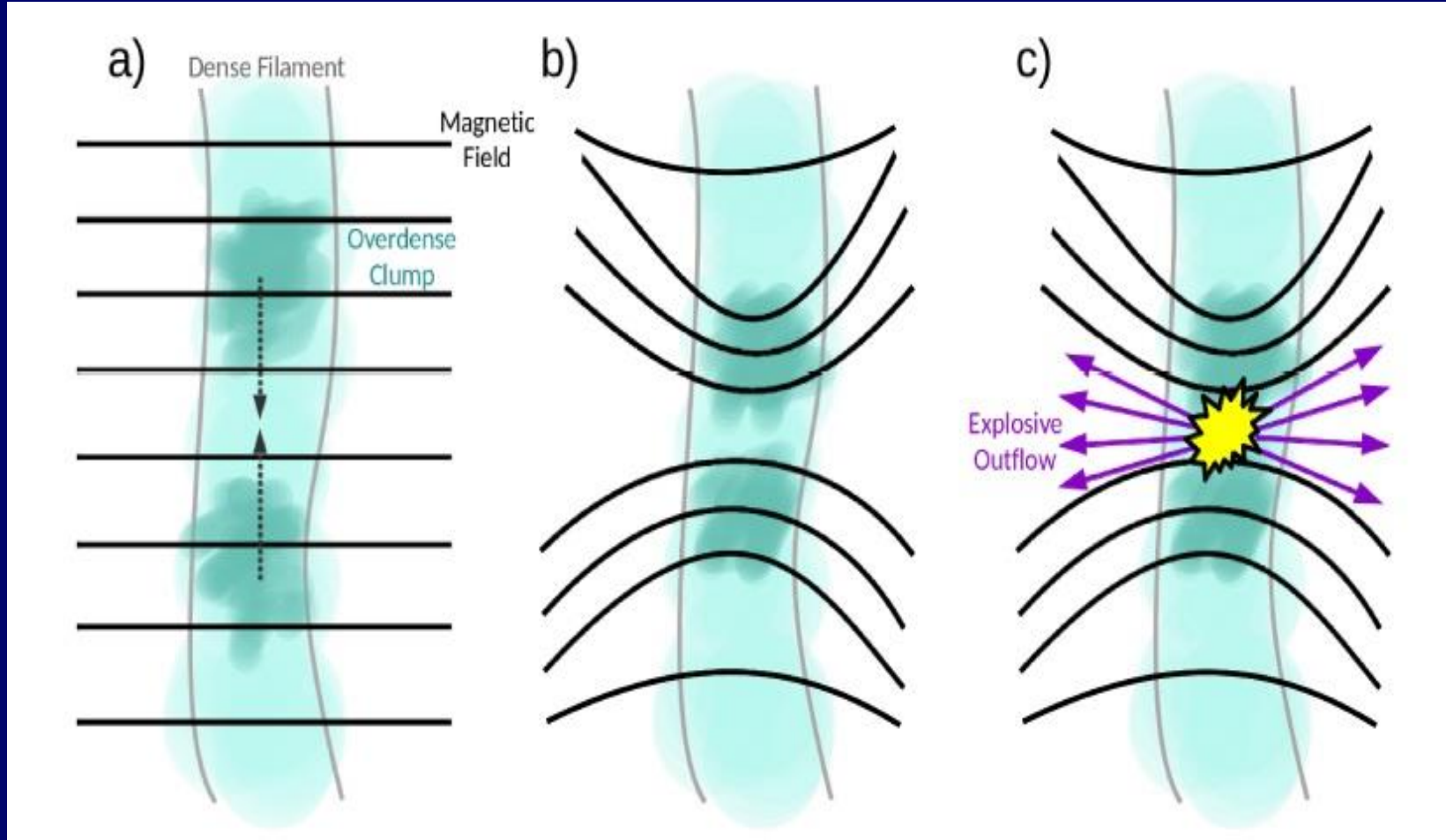
# Orion A



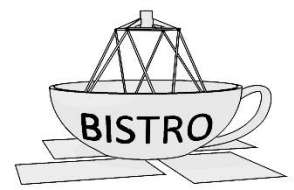
Ward-Thompson  
et al 2017  
ApJ 842, 66



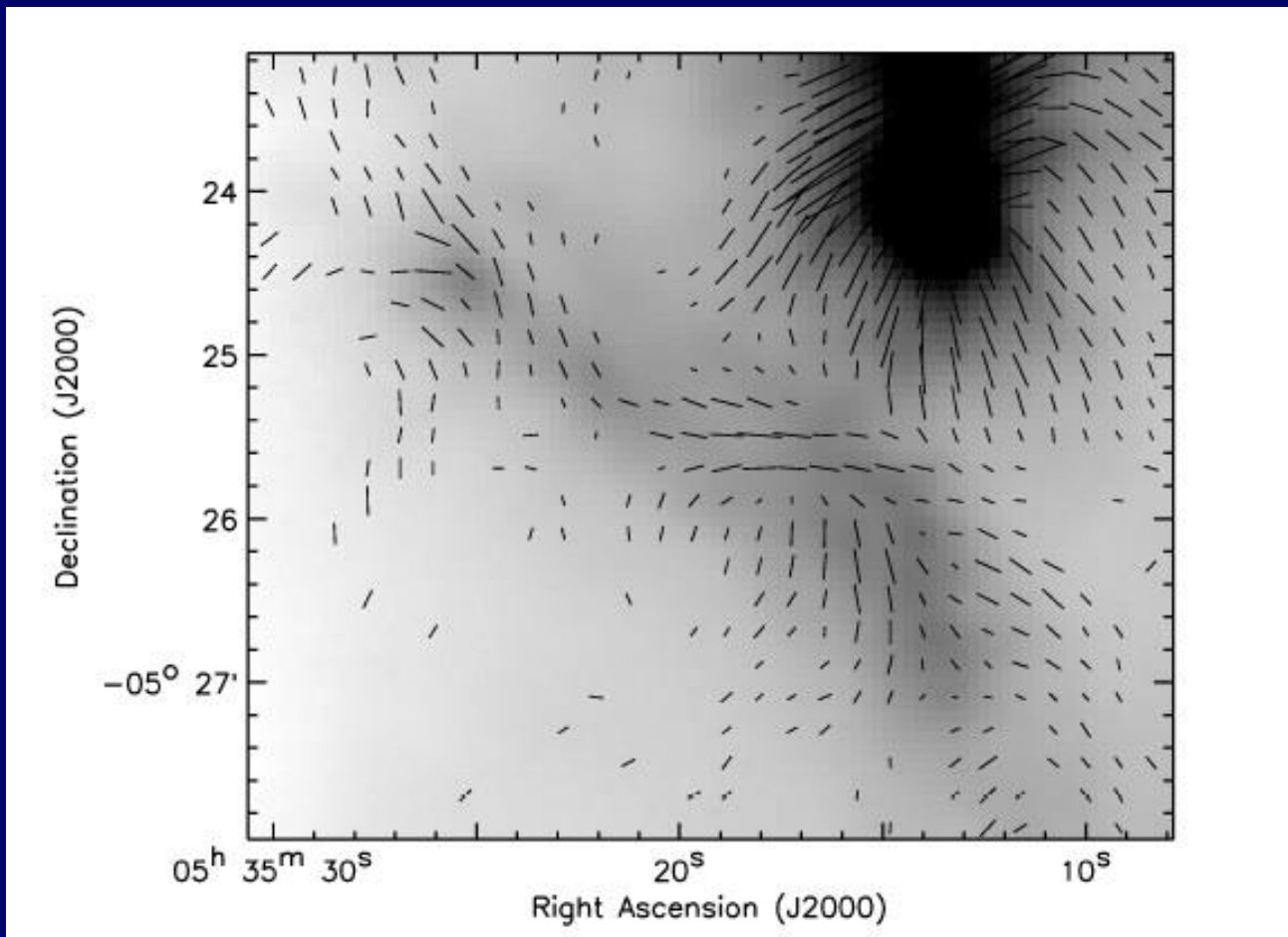
# A magnetic 'spring'



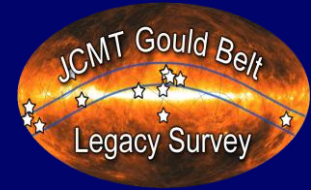
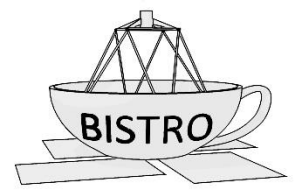
Pattle et al 2017 ApJ 846, 122



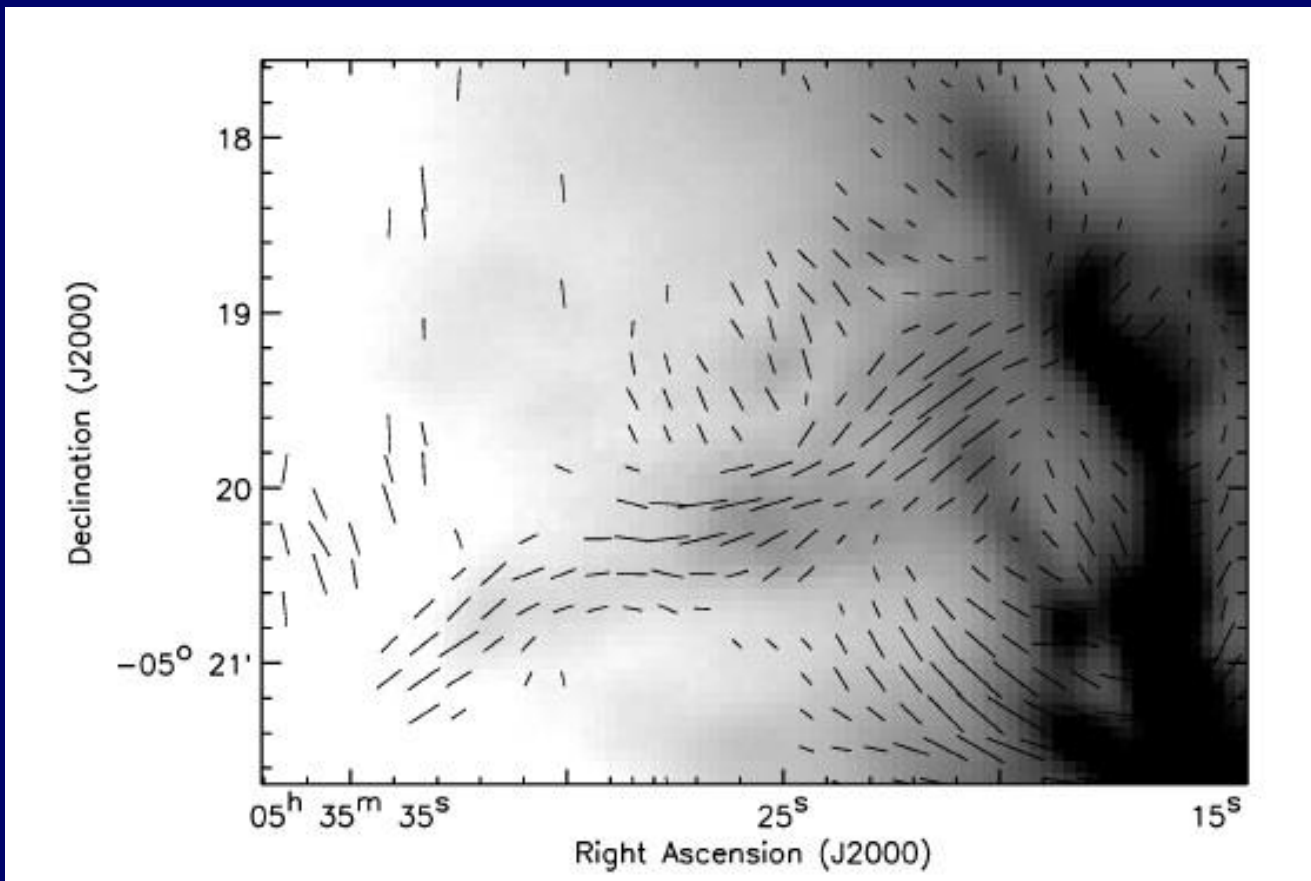
# Orion Bar



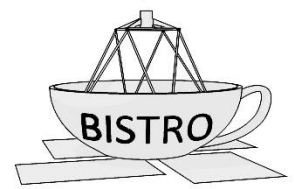
Ward-Thompson et al 2017 ApJ 842, 66



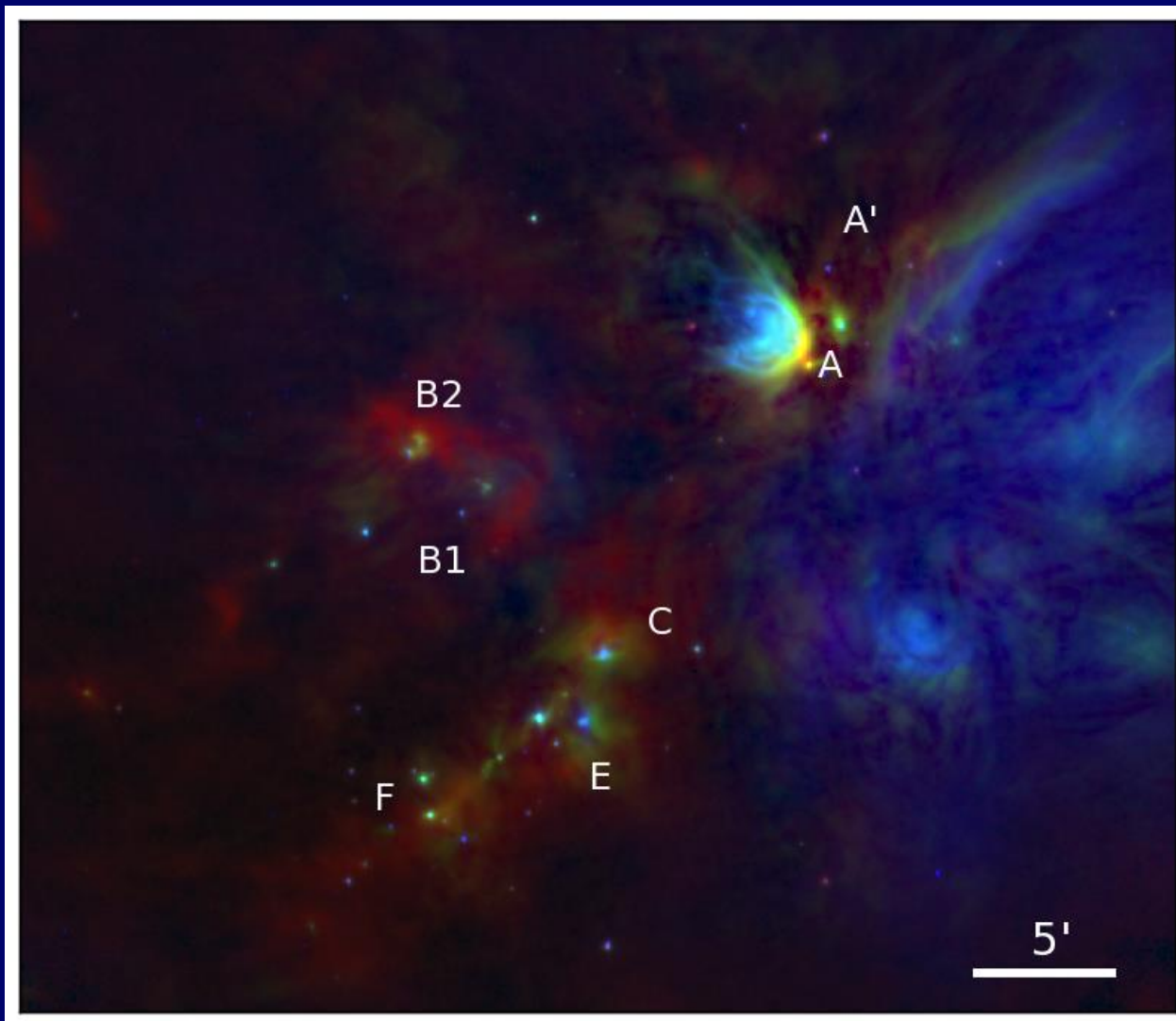
# N-E filament



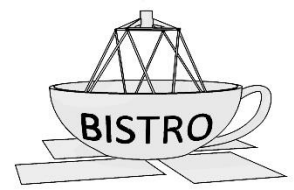
Ward-Thompson et al 2017 ApJ 842, 66



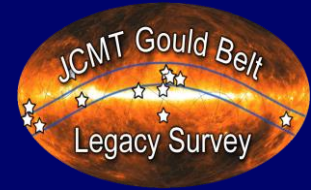
# Ophiuchus – L1688



Pattle et al.  
2015,  
MNRAS,  
450, 1094



# Conclusions



- The story before BISTRO:
  - Clouds become filamentary, form cores & stars
  - B-fields could be responsible for ‘funnelling’
  - Ionization fraction affects SFR
- BISTRO goals:
  - What role do B-fields play inside filaments & cores?
  - Are B-fields dominant?
  - What is the dense gas ionization fraction?
  - BISTRO-2 will go out to 2 kpc