

Empirical assessment of cosmic ray propagation in magnetised molecular cloud complexes

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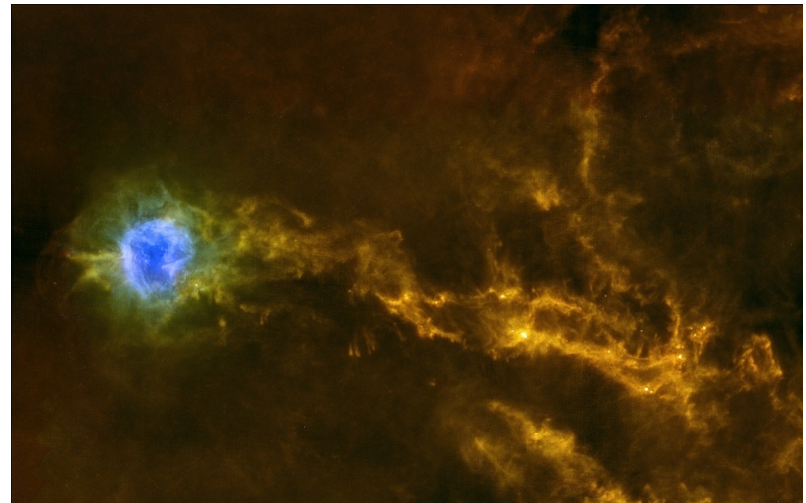
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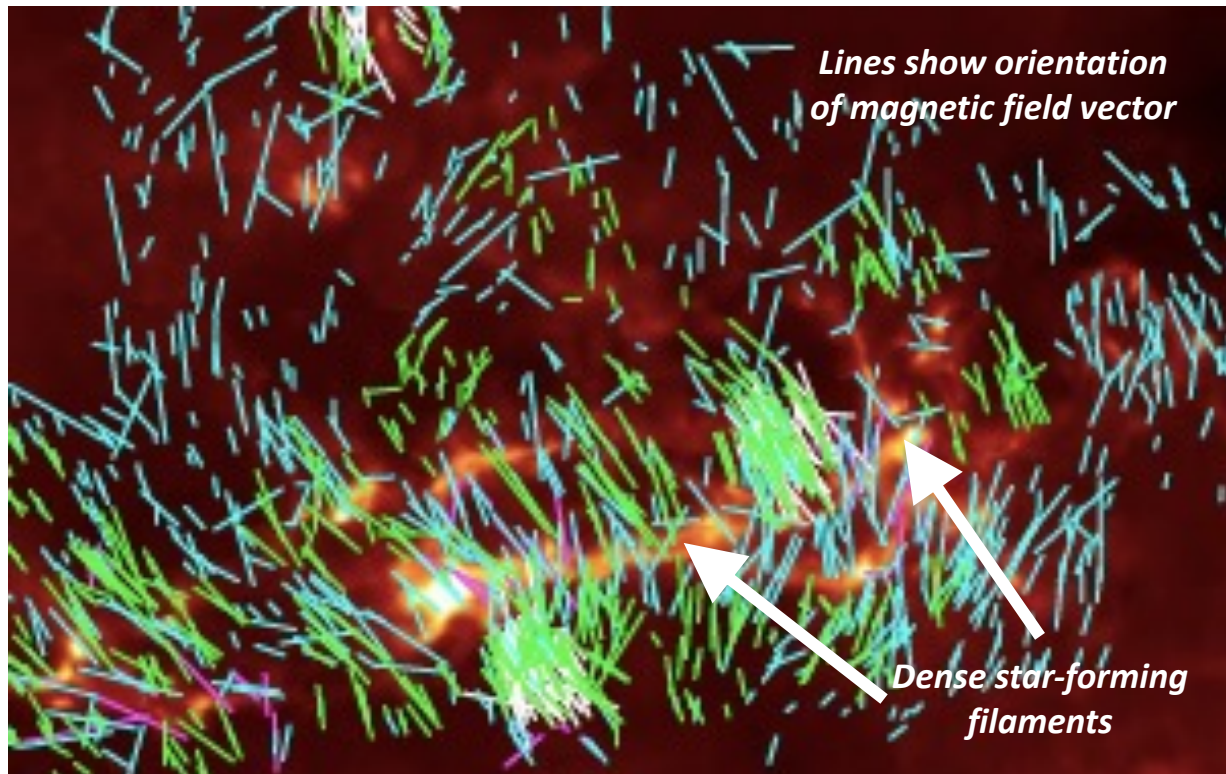
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Kinwah Wu (UCL)

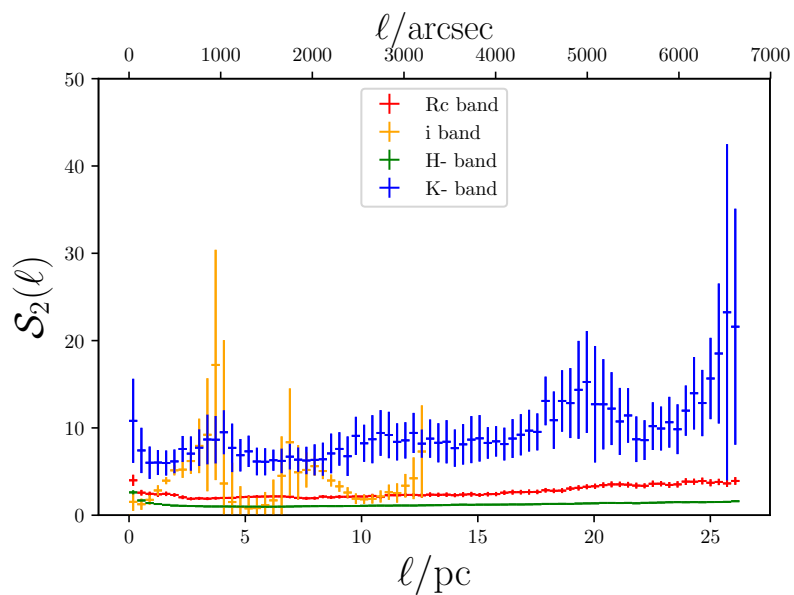


IC 5146 molecular cloud complex (Arzoumanian et al. 2011)

Cosmic ray propagation



Cosmic ray propagation



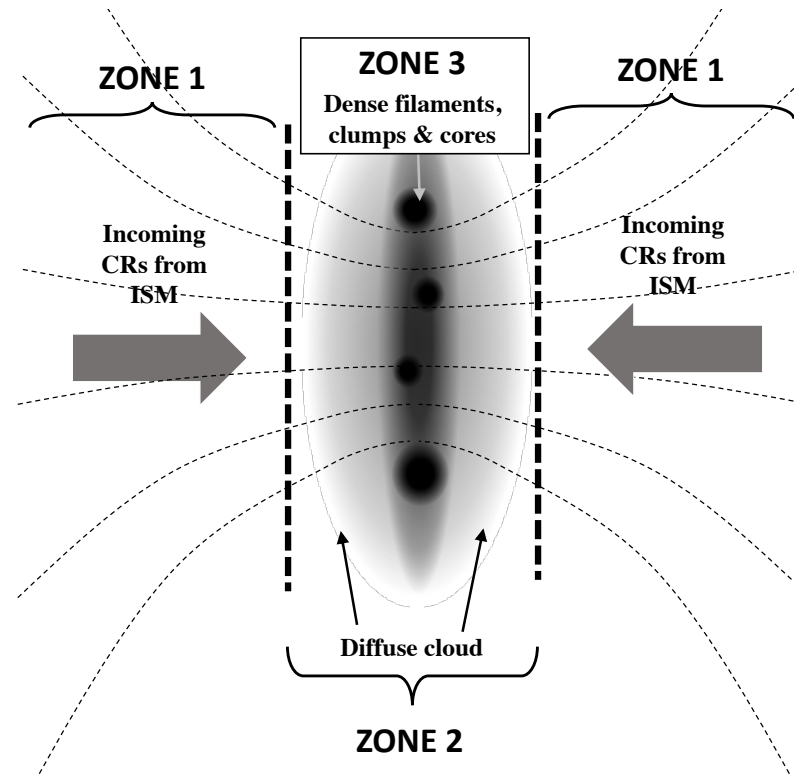
$$P(k) = \frac{1}{2} \mathcal{F}[S_2(\ell)]$$



CR diffusion coefficient

Owen+ 2021a

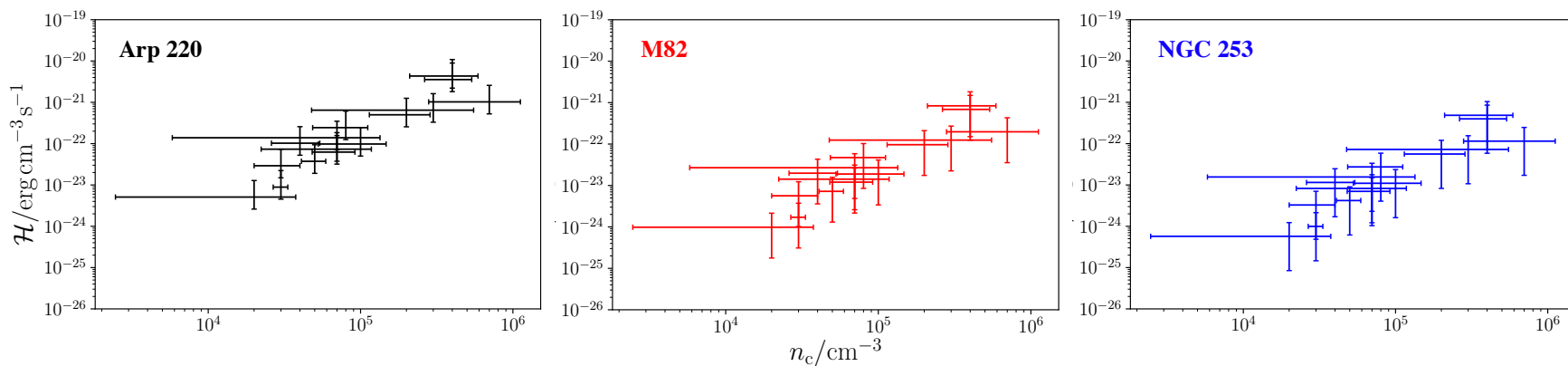
Cosmic ray propagation



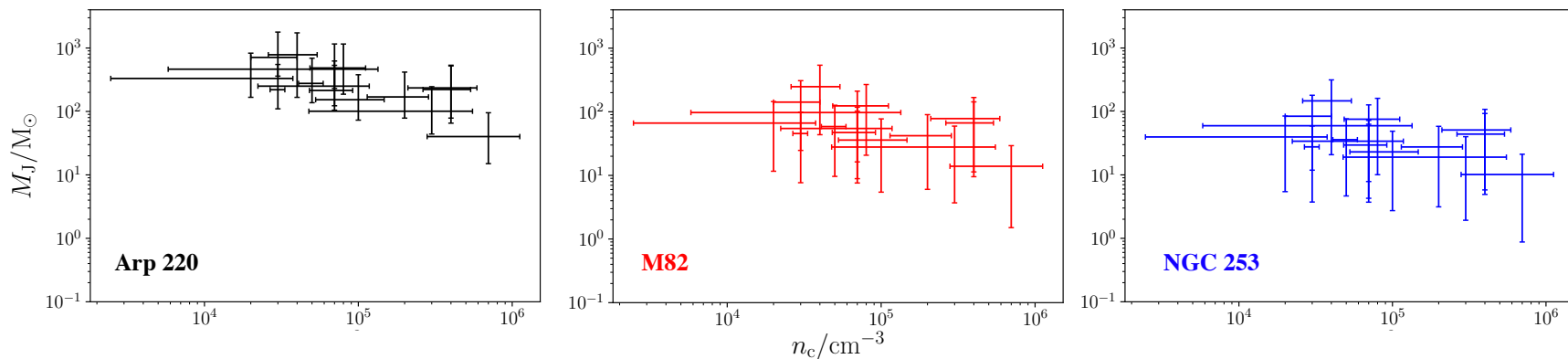
Owen+ 2021a

Cosmic ray feedback

Cosmic ray heating



Jeans' mass of filaments



Key points

1. Introduce a new way to empirically determine CR propagation through molecular cloud complexes
2. Apply to the IC 5146 region
3. Solve transport equation and compute heating power
 - a. Not significant in Galactic conditions
 - b. Could be important in starburst galaxies

For details see full paper:
Owen, On, Lai & Wu *ApJ* 913, 52 (2021)
arXiv: 2103.06542

