# Invited: The Formation of Dense Gas Structures within a Magnetized Giant Molecular Cloud: A BLASTPol Study of Vela C

**- Laura Fissel**

The extent to which magnetic fields influence the formation and evolution of dense filamentary structures within molecular clouds remains a key open question in our understanding of the star formation process. In this talk I will show comparisons between the magnetic field morphology of the young giant molecular cloud Vela C, as traced by the BLASTPol balloon-borne sub-mm polarimeter, and the orientation of elongated molecular gas structures, as traced by molecular line maps from the Mopra telescope and Herschel-derived column density maps. We find that low-density tracers 12CO and 13CO are statistically more likely to align parallel to the magnetic field, while intermediate or high density tracers show either no preferential alignment or a tendency for alignment perpendicular to the magnetic field. The transition from parallel to perpendicular orientation occurs at a molecular hydrogen number density of approximately $10^3$ cm$^{-3}$, though there are indications that this transition density may be much lower for the Centre-Ridge cloud sub-region, which harbours the highest column density filaments in Vela C and has already formed several high mass stars. Our results suggest that the orientation of the magnetic field with respect to the convergent flows that created Vela C may have affected the efficiency with which dense gravitationally unstable molecular gas was formed in the cloud sub-regions.

*Filaments*