

---

# Dealing with large data sets: Automated techniques to study star-forming filaments

Seamus Clarke\*<sup>1</sup>, Stefanie Walch , Alvaro Sanchez-Monge , and Gwennlian Williams

<sup>1</sup>University of Cologne – Albertus-Magnus-Platz, 50923 Köln, Germany

## Abstract

Recent observations have revealed that filamentary structures are prevalent on multiple scales in the interstellar medium and the densest harbour the majority of cores, the progenitors of stars. It is thus imperative to study these structures to gain a better understanding of the star formation process. Our current analysis techniques require considerable human interaction and are too time-consuming for the over 30,000 filaments identified by the Hi-GAL survey. Here we present a pipeline which contains a series of automated techniques for the analysis of filaments, including spine and core identification; filament width, line-mass and core mass estimation; spectral fitting and velocity gradient detection. I present two applications of the pipeline: to synthetic observations of a suite of simulated filaments, and to real observations of a giant molecular filament.

**Keywords:** filaments, star formation, automated techniques

---

\*Speaker