The effect of stellar magnetic activity on protoplanetary discs and exoplanet detection

Fact Sheet

Project Information

ACTIVITY & PLANETS
Grant agreement ID: 274889

Status
Closed project

Funded under
FP7-PEOPLE

Overall budget
€ 307 970

EU contribution
€ 307 970

Coordinated by
KOGENHAVNS UNIVERSITET

Denmark

Objective

"Many cool stars are born as rapid rotators, and therefore with a strong dynamo created magnetic field, which manifests itself as a high level of activity including strong flares and coronal mass ejections. This is the environment in which planets are formed, and it is therefore unavoidable that this activity has a significant impact on the formation and evolution of planetary systems. The phenomena caused by stellar activity can also have similar effects on stellar brightness and radial velocity as orbiting planets, making it at times difficult to distinguish between planets and activity signatures, especially when using radial velocity searches to find small Earth sized planets. Today we have a unique opportunity to address these points with the new upcoming European and global observational facilities (Atacama Large Millimetre/sub-millimetre Array and Stellar Observations Network Group). In this
project we suggest two main lines of investigation:

1) Constructing a freely available database on expected effects of the activity on the detectability of the exoplanets using different methods. We will build a realistic model of activity patterns on different types of stars and using large range of stellar parameters. This model will be used to probe different activity cases, resulting in a database of activity patterns and likelihood of them mimicking different types of exoplanets. This will be crucial for detectability of small, Earth mass, planets using long-term radial velocity measurements with SONG.

2) Studying the effect of the stellar magnetic activity on the protoplanetary discs. By using mid-infrared and sub-millimetre observations of active and non-active young stars with discs a comparison of the disc properties in these two types of stars can be made. We will study the dust properties in the discs and investigate whether the additional heating from magnetic activity significantly changes the dust constitution, thus affecting the planet formation process.

Field of science

/natural sciences/physical sciences/astronomy/planetary science
/natural sciences/physical sciences/astronomy/planetary science/planets/exoplanetology
/natural sciences/physical sciences/astronomy/planetary science/planets

Programme(s)

Topic(s)

Call for proposal

FP7-PEOPLE-2010-IEF

Funding Scheme

MC-IEF - Intra-European Fellowships (IEF)

Coordinator

KOBENHAVNS UNIVERSITET

Address  Activity type  EU contribution

€ 307 970
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Last update: 1 August 2019  
Record number: 98524  

Permalink: https://cordis.europa.eu/project/id/274889  

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