

## Post Doctorate Fellowship

THE IMPACT ON HAIL PRODUCTION OF AEROSOL LOADING AND WATER VAPOR TRANSPORTED BY  
THE LOW LEVEL JET FEEDING INTO SEVERE STORMS IN SOUTHERN BRAZIL

Supervision: Maria Assunção Faus da Silva Dias

### Contact

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Deadline: 31/10/2018

24 months, 40 hours per week

Salary: ca. 7000 reais/month plus benefits

In the context of the project: **PRIMARY BIOLOGICAL AEROSOL PARTICLES (PBAPS): SAMPLING AND MODELING AT SOUTHERN BRAZIL ASSOCIATED TO IMPROVEMENTS OF CLIMATE MODELS**

**FAPESP PROJECT (2016/06160-8), coordinators:** Profs. Drs. Fábio L T Gonçalves/Vaughan Phillips

Context: Airborne particles directly and indirectly impact Earth's climate as well as human and animal health. This project will explore the status of the current and incomplete global climatology of hail, hail formation, its relation to primary biological aerosol particles that are ice nuclei (PBAP-IN) to explain the observed behavior for the Southern region of Brazil. Remote sensing techniques and downscaling scenarios will be considered in the analysis proposed in this project and methods able to assess the impact of future climate scenarios. This research is expected to evaluate the knowledge about PBAP-IN and hail phenomena and improve the modern techniques of detection of hailstorms by satellites, including the assessment of any signal of climate change impact. Finally, the project will provide the community with observations of the local and specific conditions of hailstorms occurrence, related to PBAP-IN and, based on these conditions, establish the synoptic or large-scale circulation patterns under which the phenomena occur in the South and Southeast of Brazil and what behavior could be expected to the future.

This postdoctoral project will focus on clarifying some of the physical processes involved in severe storms.

**The objective** is to provide a high resolution documentation and diagnostics of the physics involved in the formation of severe storms in Brazil and relate their intensity to the water vapor and aerosol loading of the air mass advected from the North. The main scientific question is whether the aerosol loading causes an enhancement of the severity of storms in Southeast and Southern Brazil, in particular with regards to the formation of hail. The particular interest is on aerosol that may act as cloud condensation nuclei. The rationale is to investigate the role of cloud microphysics interactions in the evolution of severe storms in Brazil.

Diagnostic analysis with satellite data and numerical simulations with high resolution numerical models are the tools expected to be used by the pos-doc candidate in order to address this problem.