ARIADNA NEWSLETTER
JULY 2005
http://www.esa.int/ariadna

ARIADNA NEWS: CALL FOR PROPOSALS 05/01 RELEASED

Following the success of the last **Call for Proposals**, the Advanced Concepts Team has again produced a list of study topics and invites proposals for work in these areas. Details of all these new ideas and how to submit a proposal are available at: - http://www.esa.int/gsp/ACT/ariadna/open_calls.htm

Solicited studies for CFP 05/01: -

05/2202 **Oxygen extraction from lunar regolith**, Type of activity: Medium Study (4 months, 25 KEUR)

05/2203 **Iron oxide extraction from lunar and Martian regoliths**, Type of activity: Medium Study (4 months, 25 KEUR)

05/3201 **Numerical simulation of the Helicon Double Layer Thruster Concept**, Type of activity: Medium Study (4 months, 25 KEUR)

05/3202 **Advanced Concepts of Electromagnetic Generation, Confinement and Acceleration of High Density Plasma for Propulsion**, Type of activity: Medium Study (4 months, 25 KEUR)

05/3203 **Electrodynamic tether microsats at the giant planets**, Type of activity: Medium Study (4 months, 25 KEUR)

05/4106 **Spiral Trajectories in Global Optimisation of Interplanetary and Orbital Transfers**, Type of activity: Medium Study (4 months, 25 KEUR)

05/4107 **Electrostatic forces for satellite swarm navigation and reconfiguration**, Type of activity: Medium Study (4 months, 25 KEUR)

05/4108 **The Flower Constellation Set and its possible applications**, Type of activity: Extended Study (6 months, 35 KEUR)

05/4109 **Space Webs**, Type of activity: Medium Study (4 months, 25 KEUR)

05/5102 **Information extraction and presentation using interactive agent technologies and text mining tools**, Type of activity: Medium Study (4 months, 25 KEUR)

05/5103 **Formal knowledge representation of the system level spacecraft design domain**, Type of activity: Medium Study (4 months, 25 KEUR)

05/5201 **The application of clouds for modelling uncertainties in robust space system design**, Type of activity: Medium Study (4 months, 25 KEUR)

05/6203 **Bio-inspired distributed system for thermal (or particles) transport**, Type of activity: Extended Study (6 months, 35 KEUR)
N.B. This study description is currently undergoing significant clarification. Once completed, details will be posted at: - http://www.esa.int/gsp/ACT/ariadna/faq.htm

05/6401 **Strain sensors inspired by campaniform sensilla**, Type of activity: Medium Study (4 months, 25 KEUR)

05/6402 **Non invasive brain-machine interfaces**, Type of activity: Short Study (2 months, 15 KEUR)

ACT CAREER OPPORTUNITIES

The ACT currently has three research fellowships available:

- Mission Analysis and Trajectory Design
- Advanced Energy Systems
- Collaborative Open Design

For more details on these positions and how to apply, go to: http://www.esrin.esa.int/gsp/ACT/opportunities.htm

SPACE TECHNOLOGY NEWS

Periodically the European Space Agency issues Invitations To Tender (ITTs) on a broad range of subject areas and activity types, ranging from scientific and technical studies, to technology development activities or even basic infrastructure support services. A list of both the intended and currently open ITTs can be accessed at http://emits.esa.int/. Below, is a selection of those that could be of particular relevance to universities and academic researchers:

European Space Agency
Agence Spatiale Européenne

ESTEC
ACT, EUI-P, Keplerlaan 1 - 2201 AZ Noordwijk - The Netherlands
Tel. +31 (0)71 565 5174 - Fax +31 (0) 71 565 8018

Solar Energetic Particle Environment Modelling
This activity will create new engineering models to address future needs, in particular: - ingest new data and to take into account recent advances in understanding the generation mechanism; enable automatic model update and establish community consensus; - rather than producing only mission-integrated fluence for a given confidence level (for dose, solar array degradation), models will be designed to produce new types of user products, including peak flux statistics, durations of high flux periods, etc. (suitable for SEU rate and radiation background); - integrate databases of ion species and their fluxes into tools for SEU and background calculation so that past events and future scenarios can be simulated; - examine (limited) available data and improve physics-based shock-acceleration models to predict the expected event time profiles at non-Earth locations (near-Sun, Mercury, Venus, Mars,...) in order to get a realistic model of helio-radial variations to replace the (1/r^2) “rule of thumb" which leads to possibly over-severe environment specifications. Tender Status: Issued. Price Range: 200-500 KEUR. Responsible: Mr. Roederer. More Information at: http://emits.esa.int/emits/owa/emits_iitt.show_iitt?actref=04.1EE.15&user=Anonymous

Super Conductive Materials For Electric Propulsion Systems
High power electric propulsion systems intended to perform orbit raising and NSSK manoeuvres for telecommunication missions will require high current coils that will benefit from a technology capable to reduce the mass of these coils. Lorentz force electric thrusters could be in principle designed in which fields, and therefore thrust, could be dramatically higher with a simultaneous reduction in coil power, weight and volume. This activity is a study to assess the feasibility of using super conductive materials in electric propulsion. The study will be supported by measurements on breadboards of critical elements. Tender Status: Issued. Price Range: 200-500 KEUR. Responsible: Mr. Sandberg. More Information at: http://emits.esa.int/emits/owa/emits_iitt.show_iitt?actref=05.153.25&user=Anonymous

Forecasting Of Ionospheric Scintillations
An experimental network of high data rate GPS receivers will be set up and a quasi real time data collection process will be initiated, and algorithms will be developed in order to condense the collected data and obtain the pertinent parameters. The objective of the activity is to produce a solid scintillation model, which can be used in all regions of the world and which allows the temporal and spatial forecasting of scintillation events. Tender Status: Issued. Price Range: 200-500 KEUR. Responsible: Mr. Sandberg. More Information at: http://emits.esa.int/emits/owa/emits_iitt.show_iitt?actref=03.153.21&user=Anonymous

Life Marker Chip
To develop and construct an advanced laboratory breadboard/engineering model, able to verify the instrument's end-to-end functionality. This prototype is intended to become the basis for realising the instrument's flight version. Additionally, to develop the antibody libraries required for the ExoMars mission. The goals of the project will be: - Definition of final user requirements; - Design and construction of a fully-operational, integrated laboratory breadboard/engineering model with commercial components; - Laboratory testing with reference and natural samples; - Construction of required antibody libraries; - Recommendations to further reduce the overall size, weight and power consumption of flight instrument (target mass < 1 kg); - Recommendations to improve robustness, radiation hardness, reliability and ease of assembly. Tender Status: Issued. Price Range: >500 KEUR. Responsible: Mr. Gardini. More Information at: http://emits.esa.int/emits/owa/emits_iitt.show_iitt?actref=05.139.09&user=Anonymous

Imaging Lidar Technology
The recent emergence of novel and advanced technologies like new 2-dimensional detector arrays (APD or CMOS arrays) and optical micro components (like MEMS and MOEMS) will bring a new trend in the development of compact, high resolution and multi-task sensor Imaging Lidars. This activity shall study the use of these novel technologies, assess the impact on the Lidar performances and develop an Imaging Lidar proof-of-concept breadboard that validates these technologies, making the Imaging Lidar a feasible instrument for space applications in the frame of AURORA. Tender Status: Issued. Price Range: >500 KEUR. Responsible: Mr. Lutz. More Information at: http://emits.esa.int/emits/owa/emits_iitt.show_iitt?actref=04.129.05&user=Anonymous

ARIADNA IN SHORT

With Ariadna, ESA intends to strengthen the bond between Academia and ESA by providing opportunities to work in partnerships and making up-to-date information available on on-going ESA studies and advanced space technology news relevant to the academic world. Check http://www.esa.int/ariadna for news or updates on coming Ariadna call for Proposals.

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