agropolis fondation

Agropolis Fondation & Inria

Call for proposals 2009

"Computational Plants and Ecosystems"

[Ref. CfP 2009-02]

TERMS OF REFERENCE

I. Background

Established in 2007, Agropolis Fondation is a charitable institution dedicated to the support of research and education in plant science and sustainable agricultural development.

From its base in Montpellier in the south of France, the Foundation is able to draw on an extraordinary pool of international expertise and talent in the fields of agriculture, food, biodiversity and the environment.

It supports interdisciplinary research that focuses on some of the key issues facing the temperate, tropical and Mediterranean regions: plant adaptation to climate change, the increasing demand for plants and plant by-products for food and non-food uses, the prevention and management of risks related to crop and food systems, and the sustainable management of natural resources.

The Foundation is dedicated to creating a world class, international scientific network working across a wide range of scientific disciplines to promote integration and innovation while ensuring that cutting-edge science responds to these development challenges through (a) an integrated approach to plant research - from its genes to its environments to its final uses; (b) a uniquely interdisciplinary approach that combines technical and social sciences; and (c) pooling scientific knowledge and experience from the whole range of climatic environments: Mediterranean, tropical and temperate alike.

From the outset, the Foundation has affirmed that the development of scientific partnerships at the interfaces between Agricultural Sciences and more fundamental disciplines, in particular Mathematics & ICST -Information and Communication Science and Technology- , is a key issue.

The priorities of Inria[1] for the next five years are defined around the following key areas in ICST of *Modelling*, *Communicating*, *Programming* and *Interacting*, in addition to the interdisciplinary priorities of *Computational Engineering*, *Computational Medicine* and *Computational Sciences*. The latter includes Computational Plants, Ecology and Environment.

Given their shared interests, Agropolis Fondation and Inria have decided to carry out common actions at the interface between Agricultural Sciences and Mathematics & ICST. The programme is called « Computational Plants and Ecosystems ». Its main thrust is a model-centered approach for plants, ecosystems, and plant utilization. This project includes 3 main topics, namely:

- Computational modelling of plants and plant utilization
- Software platforms
- International collaborative projects

In 2008, Agropolis Foundation and Inria launched their first joint Call for Proposals (CfP) with a similar scope (Computational Plants & Ecosystems), which led to the funding of 10 projects, for a total grant of 4 million €, including the funding of Pl@ntnet (3 million €) as a Flagship Project of the Foundation.

[1] Inria, the French National Institute in Information and Communication Sciences and Technologies (http://www. inria .fr)

II. Scope of the Call for Proposals (CfP)

The present Call for Proposals (CfP) targets development- and innovation-oriented research activities that focus on main scientific challenges related to a more improved interface between agricultural sciences, mathematics, and information and communication science & technologies (ICTs).

As such, this CfP will privilege proposals that:

- clearly demonstrates the integration of the various disciplines mentioned above
- tackles both plants and ecosystems (and their interaction)
- presents how research outputs (e.g., models, tools, software, etc.) can be put into use
- involves partnership (including co-funding) with the private sector

The modelling process produces a virtual representation of the plant and its environment, which can be implemented as computer programs, and used, for instance, for visualization, evaluation and optimization purposes, and generally as an experimental tool allowing the confrontation with data, the estimation of parameters, etc.

Modelling plants as a system, or through its interactions with its environment, typically involves models of complex dynamic systems, the understanding of which involves more and more computer implementations and computerized experiments.

The goal is to conceive, analyze, implement, simulate and validate models of plants and their interactions with ecosystems.

The following non exhaustive topics are of particular interest in the context of this Call for Proposals:

1. plant systems biology and integrative biology (signalling, adaptation, development, organogenesis and morphogenesis, including bio-mechanics, *etc.*)

2. plant and plant pests and pathogens diversity, systematics and evolution (from phylogenetic approaches to field-oriented taxonomic identification systems; from population and quantitative genetics to plant breeding; *etc.*)

3. plant/pest or pathogen interactions and symbiotic interactions (from molecular and cellular interactions to large scale epidemiology)

4. ecosystem & landscape functioning, dynamics and management (interactions between plants and resources (atmosphere, water, nutrients, *etc.*); soil/plant roots interactions and related biogeochemical cycles; plant/plant and plant/pests and pathogens interactions; *etc.*)

5. processing of plant products for food and non-food uses (processes and their control, bioprocesses, bioreactors, quality of plant products, *etc.*)

6. integrated cropping systems (plantation, optimal fertilization, pest and disease control, harvest, post-harvest operations, *etc.*): design, optimization and assessment

7. large scale data integration (high throughput genotyping & phenotyping, 3D-4D imaging, distributed sensor networks, *etc.*).

The research and development activities related to mathematical and computer modelling which are favoured under this Call include:

1. multi-scale modelling (gene-cell-tissue-organ-plant-population-community-ecosystem-landscape)

2. dynamic models, discrete or continuous

3. deterministic or stochastic models

4. spatio-temporal models

5. optimal control, optimization, game theory, decision making

6. computer imaging, algorithmic geometry, virtual reality

7. computer simulation, *in silico* experimentation

8. software sensors and failure diagnostic

9. coupling of models and data (data assimilation, computational statistics, model validation, *etc.*)

Under this 2nd CfP, it is expected that a dozen of proposals will be financially supported up to no more than 100K€ per proposal. Proponents are strongly encouraged to seek co-funding and other partnership arrangements, in particular with the private sector.

III. Eligibility of proposals submitted for funding by the Foundation

Eligibility is restricted to proposals:

- Involving at least one unit specialized in Agricultural sciences and one unit specialized in Mathematics or Information and Communication Science &Technology;

- Put forward by a unit belonging to the Foundation's scientific network and led by a couple of project leaders (Agricultural sciences/ Mathematics & ICST) who work in twos. Proponents outside of the Foundation's scientific network interested to submit a proposal should develop and present their application jointly with at least one of the Foundation's research units[2].

IV. Description of the categories of funding

1. Under the present Call for Proposals, proponents may apply for any of the Foundation's eight (8) funding categories, namely:

   Category 1: Senior Fellowship

   Category 2: Junior Fellowship

   Category 3: Post-doctoral Fellowship

   Category 4: Doctoral Fellowship

   Category 5: Visiting Fellowship for short period of stay

   Category 6: Grants for scientific platforms, **restricted to software platforms, and including financial support for salaries for software development engineers**

   Category 7: Sponsorship of international training courses

   Category 8: Small grants
   (should not include any type of support under Categories 1 to 7 above)

   8a. Support for the organization of high-level scientific events (conferences, seminars, workshops, etc.)

[2] For the list of the Foundation's research units, please visit www.agropolis-fondation.fr . Interested parties are highly encouraged to contact directly the concerned research unit(s) in writing.

8b. Support for the preparation of application to international Calls for Proposals. **This includes the support to networking and relationship development aiming at elaborating projects to be submitted to international donors.**

8c. Overseas travel grants for Doctoral and Post-doctoral scientists

8d. "Release from teaching duties" with a view to contributing to the attainment of Foundation's objectives

8e. Support for publication and dissemination of research results

8f. Support for small exploratory, risky and innovative projects (proof-of-concept studies, new frontier research)- concerning either research or training by research

8g. Support to hosting pre-doctoral students

2. The funding categories above are further defined in Attachment 2 which also outlines the selection and specific eligibility criteria per category, the required counterpart funding from the research units as well as the corresponding level of financial support that can be provided by the Foundation.

3. Proponents can submit their application for funding which combine several support categories. Such ***"Packages"*** are expected to create a strong leverage effect on the promotion or strengthening of strategic scientific themes and international visibility.

4. Concerning visiting fellowships, candidatures will be encouraged from scientists from or having worked in developing, emerging, southern or Mediterranean countries. Candidates should not have resided or carried out their main activities[3] (work, studies, etc) in France for no longer than 12 months within a three-year period prior to the date of submission of the proposal.

5. All proposals are expected to foster strong linkages between the Foundation's scientific network and external partners specialized in Mathematics & ICST, and to create a strong leverage effect on international visibility and attractiveness.

V. Criteria for the evaluation of the proposals

Proposals submitted to the Foundation shall be evaluated according to the criteria listed below. Complementary or specific eligibility or evaluation criteria for each category of support are defined in the Attachment 1.

1. Scientific quality: originality, innovativeness, feasibility. *In the case of proposals involving the development software platforms, and the recruitment of software developers, the capability of the teams to supervise this activity will be a key point in the evaluation.*

2. Fostering strong linkages
   i. Interactions between agricultural sciences and mathematics & ICST
   ii. Interactions between disciplines, and in particular interactions between social and bio-technical sciences
   iii. Interactions between temperate, Mediterranean and tropical issues to be tackled by the proposed project
   iv. Partnership strengthening, in particular with the private sector, and with Southern and Mediterranean areas

3. Contribution to international attractiveness and visibility

4. Relevance to socio-economic and sustainable development issues. *Although the focus is clearly on stimulating the interactions between agronomy and ICST, proposals should explicitly state*

[3] Short stays such as holidays do not count.

how its expected outputs (data, knowledge, software, tools, etc.*) can(- or will-) be put in use, and linked to broader issues related to sustainable development.*

5. Value addition (value addition of the Foundation's financial support as compared to other sources of funding? is the Foundation the most appropriate funding source for the proposed initiative? What is the leverage effect of the Foundation's funding to the proposed initiative?)

VI. Submitting proposals and provisional Calendar

1. Depending on the funding category, proposals will undergo either

   (a) "One stage process" i.e., submission and evaluation of the Concept Note (CN). This is the case for categories 2, 3, 4, 5, 7, and 8

   OR

   (b) "Two-stage process" which involves(1) submission of a Concept Note (CN); (2) CN proponents receiving positive evaluation will be requested to submit a Full Proposal which will be subjected to a second round of review. This is the case for categories 1 (Senior fellowships) and 6 (Scientific platforms), and proposals that will be classified as "Packages".

2. All submitted CN must be written in English.

3. All submitted CN regardless of funding Category must follow the prescribed format provided by the Foundation (Attachment 2) and should include:

   a. One-page Financial Annex (Attachment 3)
   b. Gantt Chart (Attachment 4)

4. All CN must be sent electronically to cfp2009-02@agropolis.fr by the deadline indicated below. Incomplete submissions will be automatically disqualified.

5. By submitting a proposal, the proponent assures that he/ she has obtained the approval of his managing authorities and of all the participants involved in the project.

6. For Senior Fellowships, the Full Proposal must include the *curriculum vitae* (CV) of the candidate. In the first stage, the CN can be submitted without any pre-identified candidate.

7. For Junior and Post-doc Fellowships, the CN must, to the extent possible, include the CV of the candidate. However, Concept Note may be submitted without CV if the candidate could not be identified at the time of application. In this case, proponents will have to propose a process for the identification of candidate(s) (e.g. Call for Candidates). Should this CN be selected, an agreement *in principle* will be accorded by the Foundation but the final decision will be subject to the evaluation of the candidate's CV by the Science Council.

8. For doctoral fellowship and support to pre-doctoral students, the identification of the candidate prior to the submission of the proposals is not compulsory. The CN can be submitted without any identified candidate.

9. For more information: please contact cfp2009-02@agropolis.fr

VII. Provisional Calendar

Below is the provisional calendar for CfP 2009-02:

One stage procedure (categories 2, 3, 4, 5, 7, and 8)

• Call for Proposals	06 March 2009
• Deadline for the submission of Concept Notes *Late and incomplete submissions will not be accepted.*	06 May, by 12:00
• Publication of results: the proposals selected for funding	11 June 2009

Two stage procedure (categories 1 & 6 and "Packages")

• Call for Proposals	06 March 2009
• Deadline for the submission of Concept Notes *Late and incomplete submissions will not be accepted.*	06 May, by 12:00
• Publication of results: CN selected for elaboration of Full Proposal	11 June 2009
• Deadline for the submission of Full Proposals *Late and incomplete submissions will not be accepted.*	10 September 2009
• Publication of results: Proposals selected for funding	06 November 2009

VIII. Documents attached

Attachment 1: Table of Funding Categories
Attachment 2: Concept Note Format
Attachment 3: One-page financial annex
Attachment 4: Gantt Chart

IX. Documents available online

All documents related to the present Call for Proposals are available online at http://www.agropolis-fondation.fr and http://www.inria.fr

Information concerning the Foundation and RTRA is available online at http://www.agropolis-fondation.fr