



nano-tera.ch

The Swiss Initiative in

Engineering and information technology for health and
security of the human being, and the environment

Call for Proposals
2011

Call for Proposals for Projects within the Framework of *Nano-tera.ch*

1. What are the broad objectives of *nano-tera.ch* ?

Nano-tera.ch addresses **system engineering research** that leverages micro, nano, information and communication technologies. The broad objectives of the program are both to improve quality of life and security of people across different levels of education, wealth and age and to create innovative products, technologies and manufacturing methods, thus resulting in job and revenue creation.

The intrinsic value of the underlying research is to bridge traditional disciplines, including electrical engineering, micro/nano-mechanical systems engineering, bio-medical sciences and computer/communication sciences, with the objectives of i) deepening the understanding of enabling technologies, ii) reducing scientific concepts to practice, and iii) mastering the novel challenges of designing large-scale complex systems. In this context, the scale of the design relates to the number of variables that are handled/optimized, and can be exemplified by the number of electronic devices in a chip, the number of concurrent operating system component, the amount of data to be processed in time and space, etc.. The world “tera” has been used to refer to large scale within nano-tera.ch; other groups use “peta, exa, zetta, yotta” as synonyms of large-scale.

Nano-tera.ch has been established as a “simple partnership”. This legal form enables Universities and Research Centers to meet the aforementioned synergetic objectives, by providing a neutral platform for collaboration and development. The members of the partnership, i.e. the partner institutions¹, as well as future joining members, intend to position Switzerland among the world leaders in these merging fields for Health-Security-Environment Systems Engineering. Nano-tera.ch will enhance and extend interdisciplinary research and education at the highest level to meet these challenges.

2. What are the specific goals of this call within *nano-tera.ch* ?

The *nano-tera.ch* program has several specific goals, such as pursuing excellence in collaborative scientific research, creating and expanding educational programs, constructing demonstrators of the technologies being studied and transferring the results to Swiss industry. Broad and specific objectives on nano-tera.ch are described in the website www.nano-tera.ch. The nano-tera.ch program has run successfully through a first phase with a focus on enabling technologies. This call opens a second phase targeting primarily multi-scale systems engineering.

The research space of the current program is shown in Figure 1. It consists of three applications areas, related to: i) *Wearable and implantable* systems, ii) *Ambient and environment* systems, and iii) *Energy* systems. Notice the presence of the new application area related to *Energy*, for which issues such as *power management and control* might be considered. These application areas intersect a set of basic engineering technologies, grouped in four columns. Namely: i) *Nano electronic devices and circuits*, ii) *Nano/Micro Electro Mechanical Systems (M/NEMS) and sensors*, iii) *Software and systems* and iv) *Communications*.

¹ Presently EPF Lausanne, ETH Zürich, University of Neuchatel, University of Basel, University of Svizzera Italiana, University of Geneva, CSEM

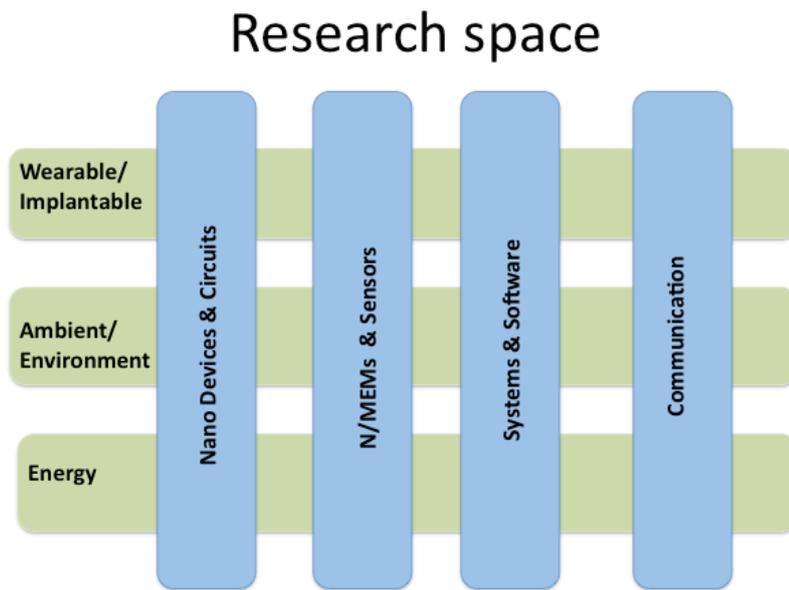


Figure 1. nano-tera.ch program structure

3. Research, Technology and Development Projects (RTD Projects)

RTD projects are integrated research projects. Major characteristics of these projects are interdisciplinarity and cooperation among research groups, preferably from different institutions, as well as the formation of doctoral students. Within one project, several research groups from complementary fields will contribute to reach the main project goals. A *nano-tera.ch* RTD project is to be proposed and led by one main applicant, the *Principal Investigator* (PI). The PI's institution, the so-called *hosting institution* of the RTD Project, will be responsible for the administration, coordination and reporting of the project. The PI will manage the project during proposal writing, and once it is approved, he/she ensures that it is carried to completion in all its aspects including reporting.

This call addresses specifically collaborative integrated projects within the research space of Figure 1. Proposed research **must meet** the following characteristics, which embody the Nano-Tera.ch strategic vision and which will be considered during the evaluation.

- **Multi-scale system engineering**, i.e., design of complex (large-scale) systems out of small (nano/micro) components. Objectives must include producing scientific and technological discoveries as well as a system demonstrator.
- **Synergy of various disciplines** through well-coordinated research efforts, to explore topics at the boundary of traditional scientific domains. An RTD project may match one or more boxes of Figure 1, but both breadth and depth must be demonstrated.

- **Collaborative nature** and **significant funding size** of the average research projects. The focus should be on research projects which could not be otherwise funded through usual channels (e.g. SNSF projects).
- **Social and industrial relevance**, in terms of projected benefits to health, security and the environment.
- **Industrial participation** to the proposed project through financial support in cash or in kind is appreciated and represents a plus in the evaluation.

Proposals that do not fit these requirements will **not** be considered for funding because they do not fit the nano-tera.ch strategic vision.

3.1 Duration, Budget

The expected duration of RTD projects is **4 years**, with a total budget up to **6 MCHF** per project, including matching funds. As required by the University Law, Article 13, participating institutions must provide matching funds (in cash and/or in kind). Matching funds must cover 55% of the total project cost.

Three sources of funding are expected to support *nano-tera.ch* projects:

A) Funding provided by *nano-tera.ch*.

B) In-kind contributions provided by the participating institutions.

C) In-kind and/or cash contributions provided by third parties.

A) Funding provided by *nano-tera.ch*.

Financial support from *nano-tera.ch* to a given RTD. (Referred to as A).

B) Matching funds in the form of in-kind contributions of the institutions

1. Personnel (Referred to as B1)

Direct costs related to personnel paid from the institution's own budget is eligible as in-kind contribution for that institution. The corresponding maximum applicable salary rates, including social charges, are summarized below.

• Full professor	325 kCHF/year	(max. 20%)
• Associate professor	290 kCHF/year	(max 20%)
• Assistant professor	255 kCHF/year	(max. 20%)
• Senior researcher	215 kCHF/year	
• PostDoc	100 kCHF/year	
• Technician	125 kCHF/year	
• PhD-Student	62 kCHF/year	

2. Equipment

Requests to include existing equipment or infrastructure as in-kind contributions must follow standard procedures (as used by SNSF grants), with commonly-applied depreciation rates.

3. Other contributions

Indirect costs linked to the project can also be considered for in-kind contributions, notably consumables and various infrastructure services provided by each institution for the performance of the project. More precisely, the official institutional overhead rate (typically 40%) on the amount listed in A and B1 can be considered as matching contribution.

C) Matching funds in the form of in-kind and cash contributions from third parties

These contributions include all support obtained from third party sources, (i.e. excluding nano-tera.ch and the institutions themselves) to support nano-tera.ch projects. They typically include industrial participation in cash or in kind. Cash funds secured to support accepted *nano-tera.ch* projects are to be reported in the annual accounting statements of the corresponding institutions.

All research Proposals for RTD projects must be submitted on the *nano-tera.ch* application forms, and satisfy the matching funds requirements above as expressed by the spreadsheet. Each proposal will present a detailed budget with both requested resources and secured matching funds. The present call covers a total amount of about 12 MCHF for funding a number of RTD projects over a period of four years, starting in the winter of 2012.

3.2 Who May Apply for RTD Projects?

Faculty members of the *nano-tera.ch* partner institutions, as well as of others Swiss Universities and of institutions of the ETH-Domain not yet members of the *nano-tera.ch* partnership are eligible as Principal Investigators. After approval by the SNSF and prior to initiation of funding each qualified RTD's hosting institute must become full *nano-tera.ch* partner.

Faculty members and senior researchers of Swiss Universities, of both Polytechnics, of institutions of the ETH-Domain, of Swiss Universities of applied sciences as well as of public and private research institutions outside the academia are eligible as Co-Investigators. In the case of private research institutions eligibility for *nano-tera.ch* funding is ruled by Article 7 Paragraph 4 of the revised Research Law (see Message for Education, Research and Innovation 2008-2011, German version p. 1448).

3.3 Documentation to be Submitted

The RTD proposals are to be submitted using the official form (cf. RTD Proposal Form) that consists of two parts:

Part 1: General Information

Part 2: Scientific Information

1. Summary (1-2 pages).
2. International standing of all applicants in their field of research (2-3 pages in total)
3. Research plan (max 15 pages in total).
 - 3.1. Overall research questions, framework of the whole project, research approach and partition into tasks, task assignment to research groups, with GANTT chart showing collaboration and exchange among groups), expected added value (max 5 pages).

- 3.2. Research plan for each task: state of the art, questions, methods, milestones and deliverables (max 2 pages for each task, including GANTT chart).
4. Significance of the planned research for *nano-tera.ch* and eventual users (private industry, economy, health and public sector, etc.) (max 2 pages).
5. Statement on how the proposal fits the characteristics of Section 3. (max 1 page)

Annexes:

- Four-year budget.
- Letters of commitment of the participating institutions (cf. Commitment Form).
- Curriculum and list of the 10 most relevant publications of all applicants.
- Existing contracts, letters of support of existing or potential industry partners.

3.4 Submission Deadline

The RTD proposals are to be submitted electronically by March 5th, 2012 to both:

admin@nano-tera.ch

and

<http://www.mySNF.ch>, using the mySNF submission system.

It is the applicants' responsibility to ensure timely delivery of their proposal. SNSF and *nano-tera.ch* reject any responsibility for (electronic) mail delivery problems.

3.5 Selection Procedure for RTD Proposals

The selection of the proposals will be preceded by a formal check by the SNSF administration. Proposals that fail to comply with the formal requirements will not be admitted to the next stage of the selection procedure and will be rejected if the deficiency cannot be easily remedied. The following formal requirements must be met:

- Compliance with the submission deadline (postmark).
- Use of the official forms and completeness of the proposal written in English.
- Eligibility of the principal investigator and the co-applicant(s).
- Official commitment of the participating hosting institution, when using large facilities and/or institutional equipment.
- Official commitment for required cash/in kind contributions.

Each RTD proposal will be evaluated by a panel of experts of the SNSF according to two major principles:

- The scientific quality of the proposal.
- The strategic importance of the proposed research as a means of reaching the overall program's objective (See beginning of Section 3).

In particular, RTD proposals will be evaluated according to the following criteria listed below in unsorted order:

- Contribution to the state of the art in the field and impact.
- Scientific quality of the proposal.
- Originality.
- Adequacy of the methodology.
- Scientific track record of the applicants in the area of the proposal.

- Feasibility, organization and financial planning of the proposal.
- Integration into the overall nano-tera.ch vision (www.nano-tera.ch).
- Relevance of the proposal toward extending the state of the art in the nano-tera.ch domains.
- Significant and genuine collaborative effort and synergy of the participants and corresponding budget.
- Feasibility of the project in terms of delivering realizations of the proposed results within the nano-tera.ch program lifespan.
- Industrial interest in the research via financial and/or technical contribution or in creating prototypes of the technology
- Differentiation of the proposed activities when compared to other funded programs.

3.6 Results of selection procedure

The SNSF panel of experts will provide the PIs with an overall detailed evaluation. Projects will be selected for funding on the basis of technical excellence and availability of funds.

Funding of accepted proposals and their start date is subject to government release of funds.

3.7 Annual Reporting

The annual scientific progress report and financial data of each RTD Project is to be submitted to the *nano-tera.ch* Management Office (cf. *nano-tera.ch* Ordinary Partnership Contract, Article 30.4 and Art. 37.4). Each PI and CoPI of a funded project will receive a guideline form with the specific reporting requirements and notification of the reporting deadlines at least three months in advance. The financial report to the Management Office of *nano-tera.ch* should present the use of the financial resources applied to the project, including nano-tera.ch funds, own and other contributions “in cash” or “in kind”.

4. Education and Dissemination activities (ED)

Education and Dissemination of results is an integral part of *nano-tera.ch*. Proposals may be submitted to support short courses, workshops, mini-conferences, as well as developing new curricula. The focus on educational activities is to fill the gap of programs that are not currently provided by Swiss Universities and Polytechnics. Proposals may address the in-depth study of a vertical technology and/or interdisciplinary horizontal activities as shown in Fig. 1.

Financial support from *nano-tera.ch* to a given ED project will require matching funds. Matching funds should cover at least 55% of the total cost of that project, as in the case of RTD projects.

Deadline for the ED project proposal is the last day of even months. The nano-tera.ch EXCOM will review ED projects directly, possibly with the help of external experts.

4.1 Who may apply for ED activities?

Applications can be submitted by faculty members and senior scientists of Swiss Universities, of both Polytechnics and of institutions of the ETH-Domain, of Swiss Universities of applied sciences as well as of public and private research institutions outside the academia. In the case of private research institutions eligibility for *nano-tera.ch* funding is regulated by Ar-

Article 7 Paragraph 4 of the revised Research Law (see Message for Education, Research and Innovation 2008-2011, German version p. 1448). In the case of proposals for developing new curricula, public and private research institutions are only eligible as co-applicants.

4.2 Documentation to be submitted

The ED proposals are to be submitted using the official form (cf. ED Proposal Form: <http://www.nano-tera.ch/proposals.html>) that consists of two parts:

Part 1: General Information

Part 2: Scientific Information

- Summary (1 page).
- International standing of applicant in her/his field of research (1 page).
- Education plan: state of the art, added value (3-4 pages).
- Expected impact (1 page).
- Curriculum and list of the 10 most relevant publications of all applicants (Annex).

4.3 Selection criteria

The EXCOM of *nano-tera.ch* will evaluate the proposals according to the following criteria:

- Formal criteria (deadline, completeness of the proposal, eligibility of the applicants).
- Focus on clearly defined scientific and technological problems in the Nano-Tera.ch scope (See Figure 1).
- Sound education and/or dissemination plan.
- Novelty and possibly uniqueness of the ED plan.
- What is the standing of the principal scientists in their respective fields?
- Does the project have a realistic budget and a clear leadership structure?

4.4 Reporting

After completion of the ED project, a scientific report is to be submitted to the *nano-tera.ch* Management Office. Financial reporting including contributions from the institutions and from third parties will be according to defined directives (cf. *nano-tera.ch* Ordinary Partnership contract, Article 37.4).

5. General Information

General information about *nano-tera.ch* is available at URL: www.nano-tera.ch . Please contact the *nano-tera.ch* office if you have any questions.

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