

PART I: For individuals

1. **Name** Irene Manzella
2. **Telephone** +41764798791
3. **Email** irene.manzella@unige.ch
4. **Address** avenue Vinet 5 1004 Lausanne Switzerland
5. **Nationality** Italian
6. **Date and place of birth** 25 November 1976, Novara, Italy
7. **Gender** F
8. **Qualifications: Give details in chronological order, starting with the most recent qualification (include date conferred, institution, and qualifications obtained)**

29 February 2008, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland: Ph.D., Rock Mechanics Laboratory

29 November 2002, Mantua, Italy: Master of advanced study in "Settlements upgrading for cooperation and development", Politecnico di Milano, Faculty of Architecture. Grade: 110/110

16 October 2001, Politecnico di Milano, Italy: M.Sc. and B.Sc., Environmental and Territorial Engineer, specialization: Land Protection, grade: 92/100
9. **Present position** Postdoc at the Université de Genève, Département de Minéralogie, section des Sciences de la Terre et de l'Environnement. Switzerland
10. **Current job description** working as assistant in the Vulcano island case study for the ENSURE European project: Commission européenne (7e programme cadre: thème 6: Environnement), "ENSURE—Enhancing resilience of communities and territories facing natural and na-tech hazards" 2008-2011. Assessment of hazard, vulnerability and emergency response of the Vulcano island in collaboration with the population, stakeholders and the civil protection. An emergency exercise with student of primary and secondary school will be held in May 2011. Main responsible of the new geophysical fluid dynamic laboratory, its conception, managing, research and in particular of the following projects:
 - a. Experimental study on convective instabilities in volcanic plumes in collaboration with Dr. J. Phillips (University of Bristol)
 - b. Study of particle aggregation by means of experiments in a vertical wind tunnel in collaboration with the "Groupe de compétence en mécanique des fluides et procédés énergétiques" (CMEFE) of the Ecole d'ingénieurs de Genève
 - c. Numerical and physical modelling of geophysical gravitational granular flows in collaboration with Professor H. Einstein (MIT), Professor J. Williams (MIT), Professor G. Grasselli (University of Toronto), Dr. J. Phillips (University of Bristol) and Dr. O. Roche (Université Blaise Pascal, Clermont-Ferrand)

Lecturer of the Risques géologiques cours (8 hours per year, third year-Bachelor) and Fluid and granular dynamics in geoscience (16 hours per year, Master).

Supervision of the PhD student Gholhamosseïn Bagheri on the study of particle settling velocity and aggregation by means of experiments in a vertical wind tunnel

Supervision of the master student Aline Cuomo for the assessment of the vulnerability, hazard and risk related to landslides and tsunamis on the Vulcano Island (Italy)

Supervision of the master student Hélène Monnard on "Convective instabilities in volcanic plumes" (final note of the master 6/6)

Assistant of CERG-C (Specialisation certificate for the assessment and management of geological and climate related risk)
11. **Previous positions held in chronological order, starting with the first position held. (Include dates held, positions held and mandate)**

2002 Trainee (3 months) at the Benedini office, Mantua, Italy. Dimensioning of sewerage systems.

2002 Consulting (2 months) for Engineer Riccardo Massara, Novara, Italy. Hydro-geological hazards.

2002 Consulting (3 months) for the NGO INDES, Managua, Nicaragua. Hazard, vulnerability and risk assessment with elaboration of GIS maps in collaboration with the municipality of Managua for the development of the legal framework and the emergency response of the city.

2003 Holding (4 months) a temporary teaching post in the scientific high school 'Antonelli' and the technical high school 'Fauser', Novara, Italy. Mathematic classes.

2003- 2008 Ecole Polytechnique Fédérale de Lausanne, Switzerland: Assistant at Rock Mechanics Laboratory. Working for the INTERREG IIIA Rockslidetec project on propagation of rock avalanches; physical modelling.

2008 Massachusetts Institute of Technology (MIT), Cambridge US: Post-doc at the Department of Civil and Environmental Engineering working with Professor H. Einstein and Professor J. Williams; discrete numerical modelling of granular flows

PART III: Special achievements

Already from the beginning of her studies the candidate made as the main objective of her career to improve her scientific knowledge about natural disaster to enhance resilience of the affected communities: the more it is known about the causes and consequences of natural hazards, technological and environmental disasters on societies, the more it will be possible to be better prepared to reduce risks.

At Politecnico di Milano she has chosen the faculty for Environment and Territorial Engineering and then the specialization in Land Protection receiving a strong formation in hydrogeology, soil mechanics, hydrology and related fields. Afterwards she has carried out her thesis project at one of the greatest hydraulic research institute: The Versuchsanstalt von Oberrach of the Technische Universität München where she carried out a project on facilities to prevent floods and she could improve her knowledge in this field.

During the master of advanced study for "Settlements upgrading for cooperation and development" and the workshop in Nicaragua her work has been concentrated on prevention and forecast of natural hazards in developing countries. Above all, this experience has improved her determination to work in this field to try to give a better standard of living and to protect people and the environment, especially where there is a lack of funds and possibilities.

This master degree allowed her to deepen her skills in environmental and conservation issues and to apply her knowledge in a development context. More specifically, she specialized herself in planning and carrying out projects in a urban and building scale, that are sustainable and culturally suitable in areas that are characterized by great needs and a lack of resources. Her project has been rooted in the local context and the collaboration and the participation of local stakeholders, NGOs and population was a priority for its development.

She had the opportunity to learn how to understand the contextual conditions and the specificity of the problems that occur in developing and emergent countries. In particular she got familiar with the settlement conditions, the modes of interpreting the technical, cultural and social conditions of each diverse community, the description of the subjects, the procedures and responsibilities involved in programs of cooperation that are aimed at planning and carrying out upgrading interventions.

During her workshop in Nicaragua in collaboration with the italian NGO Movimento Africa '70, she took part actively to the project "Asentamientos rurales y periurbanos sostenibles en el Municipio de El Viejo" which provides the upgrading of two communities with reconstruction of roofs damaged by the Mitch hurricane, building of new houses, wells, drainage, latrines, sewerage,... all at low cost and with the self-construction method. The project involved also microcredit, enforcement of the local municipality, evaluation of the natural hazard. She had also the chance to participate to a program of training for the municipal committee of El Viejo for the prevention, mitigation and attention of the natural disasters and to work into other project in this field. In addition, because of her expertise, she has been involved as a consulting in a project for the assessment of hazard, vulnerability and risk in collaboration with the municipality of Managua for the development of the legal framework and the emergency response of the city. The experience in Nicaragua has allowed her to understand which are the engines and the phases of a project in the international cooperation. As a matter of fact her master-thesis is the result of all these experiences and it proposed a new international cooperation project based on the concept of ISDR where the prevention and the diminishing of the risk is a base for the sustainability and development.

Afterwards she felt the need to improve her scientific knowledge in different natural disasters and for this reason she choose to carry out her PhD at the Rock Mechanics Laboratory of the École Polytechnique Fédérale de Lausanne (EPFL) on the study of rock avalanche propagation, an extremely dangerous landslide hazard. These four years of doctoral studies have enriched enormously her experience in the field of landslide prevention and forecast. In this framework, for the specific case of the complex and rare rock avalanche phenomena, simple empirical models for propagation forecasting are the most efficient from a cost-benefit point of view; if sufficiently reliable, they don't require

complicated computations and expensive codes. Her study improved the understanding of the main mechanisms involved in rock avalanches and of the causes of their excessive mobility, to test the reliability of existing models and to propose new empirical formulations based on a well-designed and extensive experimental campaign. Therefore this research could play an important role in the simplification and improvement of rock avalanche risk assessment.

Then her Post-doc at the Massachusetts Institute of Technology (MIT) allowed her refining her research tools, acquiring further experience in numerical modelling which are very important to assess natural hazards and are complementary to her previous experimental approach.

It was therefore with great interest and enthusiasm that she joined the group of Professor Costanza Bonadonna to design, manage and develop the new geophysical fluid dynamics laboratory for the study of several geological hazards and as assistant of the CERG-C (Specialisation certificate for the assessment and management of geological and climate related risk; <http://www.unige.ch/sciences/terre/mineral/CERG/About/Mission.html>) who works in the training of scientists for the assessment and management of risk from natural hazards with a multidisciplinary approach, merging ideas from disciplines such as the physical and social sciences, engineering, and economics.

Since January 2009, working in this laboratory allowed her to develop her skills in experimental research so crucial to improve natural hazard assessment and to enrich her knowledge related to landslide and flood research with the integration of volcanogenic hazards.

Finally because of her strong will to bring her knowledge into practice and to the service of resilience of community she has been involved in the ENSURE European project: Commission européenne (7e programme cadre: thème 6: Environnement), "ENSURE—Enhancing resilience of communities and territories facing natural and na-tech hazards" 2008-2011. Assessment of hazard, vulnerability and emergency response of the Vulcano island in collaboration with the population, stakeholders and the civil protection. Where she already could establish successful contacts between the local administration and the University, she carried out a survey to establish the physical vulnerability of the island and she is now starting a project to assess the landslide hazard, where she could put into practice the scientific knowledge on the assess of landslide propagation acquired during her PhD and postdoc at MIT. This together with the work of the volcanology group of the University of Geneva will allow assessing the risk on the island related both to the volcano and the landslide hazard. In addition with the participation of the local community and with the supervision of Professor Bonadonna and the Italian civil protection she is organizing an emergency exercise with student of primary and secondary school that will be held in May 2011.

This project, bring together all the different aspects that are important in the resilience towards risk of a community and finally is making her able to pursue her main objective to taking advantage of a deep scientific knowledge of the hazards to improve the preparedness to natural disasters.

PART IV: Proposal for the use of the award money

This award will give the candidate the opportunity of pursuing her objective to promote and teach the prevention and forecast of natural catastrophes with a special regard to issues related to developing countries. In the framework of the CERG-C although a huge effort is made to obtain the maximum number of fellowships, there is always a lack of sponsors and several students coming from low-income countries, even if selected, are obliged to renounce to the training. Given the crucial role that a high-level education plays in improving preparedness and risk assessment and to give to these students the possibility of improving their knowledge in this field and of enhancing in this way the resilience of their communities, she is planning to invest the money to sponsor the students who cannot find a fellowship and that would work on issues related to landslides and rockfall hazards.

PART V: Documentation

Curriculum vitae
Master of advanced studies thesis
Scan of Diplomas obtained
Pdf of published papers
Description of Ensure project

PART VI: Supporters

Candidates must include three letters of support from suitably qualified persons who are familiar with their work.

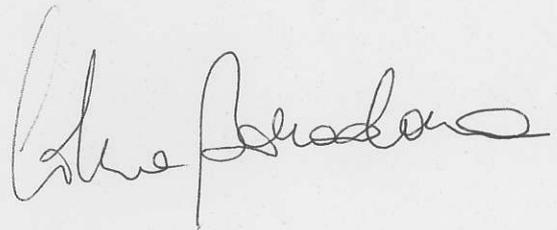
Please provide their contact details.

1. Professor Costanza Bonadonna
Head of the CERG-C (Certificat de spécialisation en évaluation et management des Risques Géologiques et risques liés au climat/Specialization certificate for the assessment and management of geological and climate related risk)
Section of Earth and environmental sciences at the University of Geneva
Rue des Maraîchers 13, 1205 Genève, Switzerland
Costanza.bonadonna@unige.ch

2. Christophe Bonnard
Independent expert in landslides
PBBG Gérances et Gestions immobilières SA
Rue Beau-Séjour 15, 1002 Lausanne, Switzerland
Christophe.Bonnard@pbbg.ch

3. Professor Eleonora Bersani
Politecnico di Milano, Dipartimento di Progettazione dell'Architettura
Via Golgi, 39
20133 Milano, Italy
egersani@polimi.it

Submitted by: Professor Costanza Bonadonna
Date of submission: Genève, 28.02.2008

A handwritten signature in black ink, appearing to read 'Costanza Bonadonna', written in a cursive style.