



**Project no.043386**

# **TRIGS**

**TRIGGERING INSTABILITIES IN MATERIALS AND GEOSYSTEMS**

<http://www.trigs.eu>

**Sixth Framework Programme (FP6)**

**New and Emerging Science and Technology Pathfinder Initiative  
(NEST Pathfinder Priority)**

## **TRIGS – Plan for using and disseminating knowledge**

Period Covered: from 01/07/2008 to 31/12/2009  
Start date of Project: January 1st, 2007  
Due Date of Deliverable: 31/12/2009

Date of Preparation: 31/01/2010  
Duration: 36 months  
Actual submission date: 15/02/2010  
Status: Draft

Project Coordinator: Dr. Stefano Zapperi

Project coordinator Organisation Name: CNR – Consiglio Nazionale delle Ricerche

Lead contractor for this deliverable: CNR – Consiglio Nazionale delle Ricerche

Revision [ 1 ]

## Contents

<b>1 Exploitable knowledge and its use</b>	<b>3</b>
<b>2 Dissemination of knowledge</b>	<b>4</b>
2.1 Publications in international journals	7
2.1.1 Published or in Press	7
2.1.2 Submitted for Publication	10
2.2 Publications in Books and Conference Proceedings	12
2.2.1 Published or in Press	12
2.2.2 Submitted for Publication	13
2.3 Joint Publications	13
2.4 Posters	14
2.5 Talks, lectures and conference presentations	15
2.6 Tutorials	20
2.7 Conferences, Workshops and Summer Schools	20
2.7.1 Completed actions	21
2.7.2 Planned actions	22
2.8 Press release (press/radio/TV)	22
2.8.1 Press and Web	22
2.8.2 Radio	22
2.8.3 TV	23
2.9 Demonstrations in Industrial and Scientific Exhibitions	24
2.9.1 Completed actions	24
2.9.2 Planned actions	24
2.9.3 TRIGS Project Web-site	24
2.9.4 Completed actions	24
2.9.5 Planned actions	24
2.10 Dissemination actions toward the other projects of the Tackling Complexity Initiative	24
2.11 Other dissemination actions	24

---

## **Chapter 1**

# **Exploitable knowledge and its use**

This project has been designed from the ground up to be fundamental research. Therefore there are no exploitable results.

## Chapter 2

# Dissemination of knowledge

### Overview of dissemination plan

To assure that the results of the project will be disseminated to a wider scientific and non-scientific audience, the following actions have been taken:

- foster publications through standard scientific and engineering communication channels. Publish results in the best scientific journals and communicate the results of the project at top conferences. Use all the possible existing communication media to touch the largest possible audience;
  - foster the dissemination of the scientific results in other contexts, such as science festivals, where the public at large and a broad scientific audience can get exposure to the ideas of the project.
  - disseminate results to the press at large in order to diffuse them as widely as possible;
  - identify all the possible actions that can be taken, beside those already described in this document, to disseminate the results to the other projects of the NEST/Pathfinder initiative and to favor synergies and possible joint activities;
  - establish and maintain a project web site;
  - maximize the availability of tools and datasets developed by the partners during the project to the scientific community as large;
  - maximize the dissemination in the research community as large of the White Paper (D6.2) that will be produced during the first part of the project;
  - exploit the fact that many partners are involved in dissemination and educational activities to train students (including Ph.D. students) and to develop course material that can be used to spread further the results of this project;
  - organize tutorials at major conferences in the different fields that are relevant to the present project. Encourage the partners to contribute to summer schools or other educational activities which touch in particular younger students. Tutorials on subjects related to the project activities will be given by the senior scientists of the network in occasion of international workshops. A special effort will be made to reach female researchers (see section on gender issues);
-

- all members of the project were encouraged to publish their results, and early-stage researchers in particular will be encouraged to present their work at international conferences.
- acknowledge funding via the FP6-NEST/Pathfinder initiative in all publications and presentations.

Efforts have been made throughout the project duration to disseminate the scientific themes related to the project beyond the traditional channels of scientific communication. Several partners (INGV, UJF, WSL/SLF) traditionally participate to public activities on geophysical risk awareness. These events were used to disseminate as the themes of of the present project.

The members of the consortium raised awareness of their own project but also actively participated in activities raising the profile of the NEST-PATHFINDER “Tackling Complexity in Science” initiative in general.

The dissemination strategy has been very effective so far and we thus plan to continue on the same line, actively addressing the issue of using and disseminating knowledge through the lifetime of the project. This will include in particular monitoring the participants actual achievements in dissemination and their plans for the exploitation of their results - for the consortium as a whole, or for individual participants or groups of participants. The project will put great emphasis on publication through standard scientific and engineering communication channels. It will attempt to publish results in the best journals and communicate work at top-level scientific conferences.

**Overview table**

<b>Dissemination Activity</b>	<b>Audience*</b>	<b>Partner</b>
1. White Paper	S	INGV
2. Publications in international journals	S	All
3. Publications in Books and conference proceedings	S	All
4. Joint Publications	S	All
5. Posters	S	All
6. Talks, lectures and conference presentations	S	All
7. Tutorials	SE	All
8. Conferences, workshops and summer schools	S	All
9. Press release (press/radio/TV)	P	All
10. Media briefing	EP	All
11. Demonstrations in industrial/scientific exhibitions	I	All
12. TRIGS project web-site	P	CNR
13. Tackling Complexity Initiative	S	All
14. Other Dissemination actions	SP	All

Audience: **S**cientific, **P**ublic, **I**ndustrial, **E**ducation

## 2.1 Publications in international journals:

### 2.1.1 Published or in Press

1. Picallo C. B., J. M. Lopez, S. Zapperi and M. J. Alava, "Optimization and Plasticity in Disordered Media" *Phys. Rev. Lett.* 103, 225502 (2009). Also as: arXiv:0911.2382.
2. Nukala P. K. V. V., S. Zapperi, M. J. Alava and S. Simunovic, "Anomalous roughness of fracture surfaces in 2D fuse models", *Int. J. Fracture* 154, 119 (2008).
3. Alava M. J., P. K. V. V. Nukala and S. Zapperi, "Fracture size effects from disordered lattice models", *Int. J. Fracture* 154, 51 (2008).
4. Nukala P. K. V. V., S. Zapperi, M. J. Alava and S. Simunovic, "Crack roughness in the two-dimensional random threshold beam model", *Phys. Rev. E* 78, 046105 (2008)
5. Leoni F. and S. Zapperi, "Slip line growth as a critical phenomenon", *Phys. Rev. Lett.* 102, 115502 (2009)
6. Imperio A., L. Reatto, and S. Zapperi, "Rheology of colloidal microphases in a model with competing interactions" *Phys. Rev. E* 78, 021402 (2008).
7. Petri A., A. Baldassarri, F. Dalton, G. Pontuale, L. Pietronero, and S. Zapperi, "Stochastic dynamics of a sheared granular medium" *Eur. Phys. J. B* 64, 531 (2008)
8. Capozza R., A. Vanossi, A. Vezzani and S. Zapperi, "Suppression of friction by mechanical vibration", *Phys. Rev. Lett.* 103, 085502 (2009)
9. Reguzzoni M., M. Ferrario, S. Zapperi, M. C. Righi "Onset of frictional slip by domain nucleation in adsorbed monolayers", *PNAS* 107 (4),1311-1316, (2010)
10. Alava M. J., P. K. V. V. Nukala and S. Zapperi, "Size effects in statistical fracture" *J. Phys. D* 42, 214012 (2009).
11. Greenhough J. and I. G. Main, "A Poisson model for earthquake frequency uncertainties in seismic hazard analysis". *Geophysical Research Letters*, 35, L19313, doi:10.1029/2008GL035353 (2008).
12. Greenhough J., A. F. Bell and I. G. Main, "Comment on paper: `Relationship between accelerating seismicity and quiescence, two precursors to large earthquakes" by A. Mignan and R. Di Giovambattista, *Geophysical Research Letters*, 36, L17303, doi:10.1029/2009GL039846 (2009).
13. Naylor M., J. Greenhough, J. McCloskey, A. F. Bell and I. G. Main, "Statistical evaluation of characteristic earthquakes in the frequency-magnitude distributions of Sumatra and other subduction zone regions". *Geophysical Research Letters*, 36, L20303, doi:10.1029/2009GL040460 (2009).
14. McCloskey J., D. Lange, F. Tilmann, S. S. Nalbant, A. F. Bell, D. H. Natawidjaja and A. Rietbrock."The September 2009 Padang earthquake and implications for seismic risk in western Sumatra". *Nature Geoscience correspondence*, in press (2009).
15. van Herwijnen A. and J. Heierli, "Measurement of crack-face friction in collapsed weak snow layers", *Geophysical Research Letters* 36, L23502, doi:10.1029/2009GL040389 (2009).

16. Heierli J., P. Gumbsch, and M. Zaiser (2008), "Anticrack nucleation as triggering mechanism for snow slab avalanches", *Science* 321, 240 (2008).
  17. Zaiser M., P. Moretti, A. Konstantinidis and E.C. Aifantis, "Roughening and pinning of interface cracks in shear delamination of thin films". *Journal of Statistical Mechanics*, P11009 (2009).
  18. Csikor F. F., M. Zaiser, P. D. Ispanovity and I. Groma, "Role of density fluctuations in the relaxation of random dislocation systems". *Journal of Statistical Mechanics*, P03036 (2009).
  19. Zaiser M., P. Moretti, A. Konstantinidis and E.C. Aifantis, "Nucleation of interfacial shear cracks in thin films on disordered substrates". *Journal of Statistical Mechanics*, P02047, 1-12 (2009).
  20. Zaiser M., J. Schwerdtfeger, A.S. Schneider, C.P. Frick, B.G. Clark and P.A. Gruber, "Strain bursts in plastically deforming Molybdenum micro- and nanopillars". *Philosophical Magazine* 88, 3861 (2008).
  21. Nielsen S., J. Taddeucci, S. Vinciguerra, "Experimental observation of stick-slip instability fronts", *Geophys. J. International*, 180, 697-702, (2010)
  22. Heap M. J., S. Vinciguerra, P. G. Meredith, "The evolution of elastic moduli with increasing crack damage during cyclic stressing of Etna basalt", *Tectonophysics*, 471, 161–169, (2009)
  23. Sbarra P., P. Tosi and V. De Rubeis "Web based macroseismic survey in Italy: method validation and results". *Natural Hazard*, 2009 DOI: 10.1007/s11069-009-9488-7 (2009).
  24. Sbarra P., P. Tosi, V. De Rubeis and C. Ferrari, "Web based macroseismic survey of 2009 L'Aquila earthquakes sequence". *EMCS News letter*, Dec 2009, 24, 34-36 (2009).
  25. Tuccimei P., S. Mollo, S. Vinciguerra, M. Castelluccio, M. Soligo, "Radon and thoron emission from lithophysae-rich tuff under increasing deformation: An experimental study", *Geophysical Research Letters*, (in press).
  26. Ventura G., S. Vinciguerra, S. Moretti, P. Meredith, M. Heap, P. Baud, S. A. Shapiro, C. Dinske, and J. Kummerow, "Understanding slow deformation before dynamic failure", *Geophysical Hazards*, Springer, Netherlands, Science, (in press).
  27. De Rubeis V., S. Vinciguerra, P. Tosi, P. Sbarra, and P. M. Benson, "Acoustic Emission spectra classification from rock samples of Etna basalt in deformation-decompression laboratory experiments", Springer, (in press).
  28. De Rubeis V., P. Sbarra, D. Sorrentino and P. Tosi (2010), "Web based macroseismic survey: fast information exchange and elaboration of seismic intensity effects in Italy". *Int. J. Emergency Management*, Vol. X., (in press).
  29. Nielsen S., J. Taddeucci, S. Vinciguerra, "Experimental observation of stick-slip instability fronts", *Geophys. J. International*, 180, 697-702, (2010)
  30. Heap M. J., S. Vinciguerra, P. G. Meredith, "The evolution of elastic moduli with increasing crack damage during cyclic stressing of Etna basalt", *Tectonophysics*, 471, 161–169, (2009)
  31. Bellaire S.; C. Pielmeier; M. Schneebeli, and J. Schweizer, "Instruments and Methods: Stability algorithm for snow micro-penetrometer measurements". *J. Glaciol.* 55, 193: 805-
-

- 813 (2009).
32. Reiweger I.; J. Schweizer, J. Dual, and H. J. Herrmann, "Modelling snow failure with a fibre bundle model". *J. Glaciol.* 55, 194: 997-1002 (2009).
  33. Schweizer J., K. Kronholm, J. B. Jamieson, and K. W. Birkeland, "Review of spatial variability of snowpack properties and its importance for avalanche formation". *Cold Reg. Sci. Technol.* 51: 253-272. (2008)
  34. Schweizer J., I. McCammon, and J. B. Jamieson, "Snowpack observations and fracture concepts for skier-triggering of dry-snow slab avalanches". *Cold Reg. Sci. Technol.* 51: 112-121 (2008).
  35. Schweizer J., C. Mitterer, L. Stoffel, "On forecasting large and infrequent snow avalanches". *Cold Reg. Sci. Technol.* 59: 234-241 (2009).
  36. Winkler K., and J. Schweizer, "Comparison of snow stability tests: Extended column test, rutschblock test and compression test". *Cold Reg. Sci. Technol.* 59: 217-226 (2009)
  37. van Herwijnen A., S. Bellaire, and J. Schweizer, "Comparison of micro-structural snowpack parameters derived from penetration resistance measurements with fracture character observations from compression tests". *Cold Reg. Sci. Technol.* 59: 193-210 (2009).
  38. Miguel M.C., L. Laurson, and M.J. Alava, "Material yielding and irreversible deformation mediated by dislocation motion", *European Physical Journal B* 64, 443-50 (2008).
  39. Laurson L. and M. J. Alava, "Driven particle in a cloud of mobile impurities", *JSTAT* 07, P07003 (2008), (10 pp).
  40. Jari Rosti, Juha Koivisto, Paola Traversa, Xavier Illa, Jean-Robert Grasso, and Mikko J. Alava, "Line creep in paper peeling", arXiv:0805.3284, *International Journal of Fracture* {bf 154}, 147-158 (2008).
  41. Lasse Laurson, Xavier Illa, Mikko J. Alava, "The effect of thresholding on temporal avalanche statistics", *JSTAT* P10109 (2008), arXiv:0810.0948.
  42. Rosti J., X. Illa, J. Koivisto, and M.J. Alava, "Crackling noise and its dynamics in fracture of disordered media" (invited review), *Journal of Physics D - Applied Physics* 42, 214013 (2009).
  43. Rosti J., J. Koivisto, and M.J. Alava, "Statistics of acoustic emission in paper fracture: precursors and criticality", *JSTAT* in press, 26 pages.
  44. Girard L., D. Amitrano, J. Weiss, "Failure as a critical phenomenon in a progressive damage model", *Journal of Statistical Mechanics*, P01013, doi:10.1088/1742-468/2010/01/P01013. (2010)
  45. Grgic D., and D. Amitrano "Creep of porous rocks and associated acoustic emission", *J. Geophys. Res.*, 114, B10201, doi:10.1029/2006JB004881. (2009),
  46. Guglielmi Y., F. Cappa, and D. Amitrano, "High-definition analysis of fluid-induced seismicity related to the mesoscale hydromechanical properties of a fault zone", *Geophys. Res. Let.* 35, L06306 (2008). % doi:10.1029/2007GL033087
  47. Helmstetter A., and B. E. Shaw, "Afterslip and aftershocks in the rate-and-state friction law", *J. Geophys. Res.* 114, B01308 (2009)

48. Helmstetter A., and S. Garambois, "Seismic monitoring of S echilienne Rockslide (French Alps): analysis of seismic signals and their correlation with rainfalls", in press in *J. Geophys. Res.* (2010)
49. Traversa P., and J. R. Grasso, "Brittle creep damage as the seismic signature of dyke propagations within basaltic volcanoes". *Bull. Seism. Soc. Am.* 99, 2035-2043 (2009)
50. Voisin C., J.-R. Grasso, E. Larose and F. Renard, "Evolution of seismic signals and slip pattern along subduction zones : Insights from a friction lab scale", *Geophys. Res. Lett.* 35, L08302 (2008).% doi:10.1029/2008GL033356
51. Wassermann J., \*D. Amitrano\*, G. Senfaute, and F. Homand, (2009), "Evidence of dilatant and non-dilatant damage processes in oolitic iron ore: P-wave velocity and Acoustic Emission analyses", *Geophys. J. Int.*, 177, 1357-1365, doi: 10.1111/j.1365-246X.2008.04017.x.

### 2.1.2 Submitted for Publication

1. Bell A. F., J. Greenhough, M. J. Heap and I. G. Main, "Challenges for forecasting based on accelerating rates of earthquakes at volcanoes and laboratory analogues", *Geophysical Journal International*, submitted (2009).
  2. Touati S., M. Naylor, I. G. Main and M. Christie, "Masking of earthquake triggering behaviour by a high background rate and implications for ETAS inversions", *Journal of Geophysical Research*, submitted (2009).
  3. Mustalahti M., J. Rosti, J. Koivisto, and M.J. Alava, "Relaxation of creep strain in paper", submitted to publication in *Physical Review E*.
  4. Daniel G., F. Renard, F. Thouvenot, L. Jenatton, A. Helmstetter, S. Hainzl, D. Marsan, "Diffusion property and spatio-temporal evolution of the 2003-2004 Ubaye, French Alps, earthquake swarm", submitted to *J. Geophys. Res.*, (2010)
  5. Lacroix P., A. Helmstetter, S. Garambois, "Localization of seismic signals associated with micro-earthquakes and rockfalls on the S echilienne landslide, French Alps", submitted to *Bull. Seism. Soc. Am.*, (2010).
  6. Tatard L., J. R. Grasso, A. Helmstetter, G. Dellow and S. Garambois "Interaction among landslides, seismicity and climate in New Zealand", submitted to *J. Geophys. Res.* (2009)
  7. Tatard L., J.-R. Grasso , A. Helmstetter and S. Garambois "Characterization and omparison of landslide dynamics in different tectonic and climatic settings", submitted to *J. Geophys. Res.* (2009)
  8. Werner M. J., A. Helmstetter, D. D. Jackson, and Y. Y. Kagan "High Resolution ong-and short-term earthquake forecasts for California", submitted to *Bull. Seism. Soc. Am.* (2009)
  9. Tatard L. and J.-R. Grasso (2010) "Are landslides the shallowest aftershocks", submitted to *Geophys. Res. Let.* (2009)
-

## 2.2 Publications in Books and Conference Proceedings

### 2.2.1 Published or in Press

1. De Rubeis V., P. Sbarra, D. Sorrentino and P. Tosi, "Web based macroseismic survey: fast information exchange and elaboration of seismic intensity effects in Italy". Proceedings of the 6th International ISCRAM Conference Gothenburg, Sweden, May 2009 J. Landgren and S. Jul, eds (2009).
2. Vinciguerra S., Xiao X. and Evans B., "Constraining melt concentration and strain distribution around basalt dykes in partially molten olivines", in *Physical Geology of Subvolcanic Systems: Laccoliths, Sills and Dykes*, edited by Thomson K. & Petford N., Geological Society Special Publication, in press.
3. van Herwijnen A., J. Heierli and J. Schweizer, Field studies of collapse propagation in weak snow layers, *Geophysical Research Abstracts*, 10, EGU2008-A-09354, EGU General assembly (2008).
4. Heierli J., A. van Herwijnen, P. Gumbsch, M. Zaiser. Anticracks: A new theory of fracture initiation and fracture propagation in snow. In: *Proceedings of the International Snow Science Workshop*, Whistler (BC), Canada, September 21-27, 2008.
5. van Herwijnen A., J. Heierli, J. Schweizer. Field study on fracture propagation in weak snowpack layers. In: *Proceedings of the International Snow Science Workshop*, Whistler (BC), Canada, September 21-27, 2008.
6. Heierli J., M. Zaiser, Crack Nucleation in Thin Films on Disordered Substrates, In: *Proc. 7th Int. Conf. on Numerical Analysis and Applied Mathematics*, Sep. 18-22, 2009 Rethymno, Greece, *AIP Conference Proceedings* Vol. 1168, 1129 (2009).
7. Konstantinidis A., M. Zaiser, E.C. Aifantis, Interfacial Shear Cracks in Thin Films on Disordered Substrates, In: *Proc. 7th Int. Conf. on Numerical Analysis and Applied Mathematics*, Sep. 18-22, 2009 Rethymno, Greece, *AIP Conference Proceedings* Vol. 1168, 1137 (2009).
8. Bellaire S.; Schweizer, J., 2009. Where to dig? - On optimizing sampling strategy. [Abstract] In: *International Snow Science Workshop*. 27 September to 2 October 2009, Davos, Switzerland. Proceedings.
9. Bellaire, S.; Schweizer, J., 2008. Deriving spatial stability variations from penetration resistance measurements. In: *International Snow Science Workshop*. September 21-27, 2008. Whistler, Canada. Proceedings.
10. Jamieson, B.; Schweizer, J.; Shea, C., 2009. Simple calculations of avalanche risk for backcountry skiing. In: *International Snow Science Workshop*. 27 September to 2 October 2009, Davos, Switzerland. Proceedings.
11. Mitterer, C.; Mott, R.; Schweizer, J., 2009. Observations and analysis of two wet-snow avalanche cycles. In: *International Snow Science Workshop*. 27 September to 2 October 2009, Davos, Switzerland. Proceedings.

12. Reiweger, I.; Ernst, R.; Schweizer, J.; Dual, J., 2009. Force-controlled shear experiments with snow samples. In: International Snow Science Workshop. 27 September to 2 October 2009, Davos, Switzerland. Proceedings.
13. Reuter, B.; Schweizer, J., 2009. Avalanche triggering by sound: myth and truth. In: International Snow Science Workshop. 27 September to 2 October 2009, Davos, Switzerland. Proceedings.
14. Schirmer, M.; Schweizer, J.; Lehning, M., 2009. Regional stability evaluation with modelled snow cover data. In: International Snow Science Workshop. 27 September to 2 October 2009, Davos, Switzerland. Proceedings.
15. Schweizer, J., 2008. On the predictability of snow avalanches. In: International Snow Science Workshop. September 21-27, 2008. Whistler, Canada. Proceedings.
16. Schweizer, J.; Bellaire, S., 2009. Where to dig? - On optimizing sampling strategy. In: International Snow Science Workshop. 27 September to 2 October 2009, Davos, Switzerland. Proceedings.
17. Schweizer, J.; Mitterer, C.; Stoffel, L., 2008. Determining the critical new snow depth for a destructive avalanche by considering the return period. In: International Snow Science Workshop. September 21-27, 2008. Whistler, Canada. Proceedings.
18. Stoffel, L.; Schweizer, J., 2008. Guidelines for avalanche control services: organization, hazard assessment and documentation - an example from Switzerland. In: International Snow Science Workshop. September 21-27, 2008. Whistler, Canada. Proceedings.
19. van Herwijnen, A.; Bellaire, S.; Schweizer, J., 2008. Micro structural snowpack parameters associated with fracture character in compression tests. In: International Snow Science Workshop. September 21-27, 2008. Whistler, Canada. Proceedings.
20. van Herwijnen, A.; Heierli, J., 2009. Measurements of weak snowpack layer friction. In: International Snow Science Workshop. 27 September to 2 October 2009, Davos, Switzerland. Proceedings.
21. van Herwijnen, A.; Heierli, J.; Schweizer, J., 2008. Field study on fracture propagation in weak snowpack layers. In: International Snow Science Workshop. September 21-27, 2008. Whistler, Canada. Proceedings.

### **2.2.2 Submitted for Publication**

## 2.3 Joint Publications

Some of the above articles were written jointly by more than one member of the TRIGS consortium as follows.

1. C. B. Picallo, J. M. Lopez, S. Zapperi and M. J. Alava, "Optimization and Plasticity in Disordered Media" Phys. Rev. Lett. 103, 225502 (2009). Also as: arXiv:0911.2382.
2. P. K. V. V. Nukala, S. Zapperi, M. J. Alava and S. Simunovic, "Anomalous roughness of fracture surfaces in 2D fuse models", Int. J. Fracture 154, 119 (2008).
3. M. J. Alava, P. K. V. V. Nukala and S. Zapperi, "Fracture size effects from disordered lattice models", Int. J. Fracture 154, 51 (2008).
4. P. K. V. V. Nukala, S. Zapperi, M. J. Alava and S. Simunovic, "Crack roughness in the two-dimensional random threshold beam model", Phys. Rev. E 78, 046105 (2008)
5. M. J. Alava, P. K. V. V. Nukala and S. Zapperi, "Size effects in statistical fracture" J. Phys. D 42, 214012 (2009).

## 2.4 Posters

1. Dalton F., Granular Gases, Beyond the Dilute Limit, Thurnau, Germany, 8-12 September 2008 - scientific meetings organized
  2. Petri A., "Il Cell Model Systems Summer School" Roma-Tor Vergata (Italy), 7-12 June, 2009
  3. Petri A., "Erice International School on Complexity, XI Course: Grains, friction and faults", Erice (Italy) July 20th 25<sup>th</sup> 2009
  4. Petri A. - XIV Convegno Nazionale di Fisica Statistica, Parma, 24-26 Giugno 2009
  5. Greenhough J. and I. G. Main. A Poisson model for earthquake frequency uncertainties in seismic hazard analysis. New Challenges in Earthquake Dynamics, Obergurgl, Austria, 18-23 September 2008.
  6. Naylor M., I. G. Main, J. Greenhough, A. F. Bell and J. McCloskey. Evaluation of the statistical evidence for characteristic earthquakes in the frequency-magnitude distributions of Sumatra and other subduction zone regions. EGU, 2009.
  7. Naylor M., I. G. Main, J. Greenhough, A. F. Bell and J. McCloskey. Evaluation of the statistical evidence for characteristic earthquakes in the frequency-magnitude distributions of Sumatra and other subduction zone regions. Frontiers of Seismology, a meeting in Edinburgh for the UK seismology community, 2-3 April 2009.
  8. Meredith P. G., M. J. Heap, P. Baud, A. F. Bell and I. G. Main. Time dependent brittle creep in rock: the influence of confining pressure and temperature. AGU 2009.
  9. Helmstetter A., L. Sanchez, S. Garambois, J.-R. Grasso, F. Doré, Y. Orenge, J.-P. Duranthon, P. Pothérat and J. Kasperski, "Seismic monitoring of a huge rockslide (Séchillienne, French Alps)", AGU Fall Meeting, San Francisco, December 2008
  10. Tatard, L., J.-R. Grasso, and A. Helmstetter, " Triggering pattern of landslides in different tectonic and weathering settings", American Geophysical Union Fall Meeting, San Francisco, December 2008.
-

## 2.5 Talks, lectures and conference presentations

In brief, the principal invited talks and seminars given by TRIGS participants were:

1. Mollo S., S. Vinciguerra, P. Tosi, P. Scarlato, A. Shubnel, M. Mari, High temperature deformation apparatus to monitor volcanic rock weakening induced from mechanical and thermal stress, Poster presentation, Experimental Mineralogy Petrology Geochemistry XII, International Conference, Innsbruck, Austria, September 8-10, 2008.
2. Benson P., Vinciguerra S., Meredith P.G., Young P.R., Laboratory simulations of coupled thermo-hydro-mechanical induced seismicity under volcano stress conditions, IAVCEI, Iceland, August 2008
3. De Rubeis V., S. Vinciguerra, P.M. Benson, P. Tosi and P. Sbarra, Classifying AE spectra from deformation-decompression laboratory experiments on Etna basalt, Poster presentation, AGU Fall Meeting, San Francisco, December 15-19, 2008.
4. Heap M. J., Baud P., Meredith P. G., Vinciguerra S., Bell A., Main I.G., Time dependent brittle deformation in Etna basalt, Poster presentation, AGU Fall Meeting, San Francisco, December 15-19, 2008.
5. Zhu W., Baud P., Wong T.-f., Vinciguerra S., Deformation and Failure Properties of Colli Albani Tuff, Poster presentation, AGU Fall Meeting, San Francisco, December 15-19, 2008.
6. Vinciguerra S., Benson P.M., Burlini L., Caricchi L., Heap M., Meredith P., Understanding pre-eruptive patterns: the rock physics interpretation, European Geosciences Union, Vienna, 19-24 April 2009.
7. Heap M. J., Baud P., Meredith P.G., Vinciguerra S., The influence of temperature on brittle creep in sandstones, European Geosciences Union, Vienna, 19-24 April 2009.
8. Faoro I., Vinciguerra S., Marone C., Elsworth D., Linking permeability and mechanical damage for basalt from Mt Etna Volcano, Italy, European Geosciences Union, Vienna, 19-24 April 2009.
9. Baud P., Zhu W., Vinciguerra S., Wong T.-f., Deformation and failure in dry and wet Colli Albani Tuff, European Geosciences Union, Vienna, 19-24 April 2009.
10. Carbone D., Musumeci C., Vinciguerra S., Linking gravity and seismic data encompassing the 2001 eruption at Mt Etna volcano (Italy): the analogy with rock deformation laboratory experiments, European Geosciences Union, Vienna, 19-24 April 2009.
11. Heap M.J., Baud P., Meredith P.G., Vinciguerra S., Bell A.F., Main I.G., Time-dependent brittle deformation (creep) at Mt. Etna volcano, European Geosciences Union, Vienna, 19-24 April 2009.
12. Tuccimei P., Vinciguerra S., Moretti S., Mollo S., Castelluccio M., Soligo M., Relating changes in radon exhalation to increasing loading in rocks. New insights from rock deformation laboratory experiments, European Geosciences Union, Vienna, 19-24 April 2009.
13. De Rubeis V., P. Sbarra, D. Sorrentino and P. Tosi, Web based macroseismic survey: fast information exchange and elaboration of seismic intensity effects in Italy. Oral presentation, 6th International ISCRAM Conference Gothenburg, Sweden, May 10-13, 2009.

14. Vinciguerra S., Benson P.M., Burlini L., Caricchi L., Meredith P., Understanding pre-eruptive patterns: the rock physics interpretation, Conferenza A. Rittmann, Nicolosi (Catania), Italy, June 2009.
  15. Mollo S., Vinciguerra S., Tuccimei P., Castelluccio M., Soligo M., Experimental study on radon emission from tuff under increasing uniaxial stress: implications for volcanic and seismic surveillance, Conferenza A. Rittmann, Nicolosi (Catania), Italy, June 2009.
  16. Trippetta F., Collettini C., Vinciguerra S., Meredith P.G., Physical properties of the seismogenic Triassic Evaporites of Umbria-Marche and their relation to field scale data, Geotalia, Rimini, Italy, September 2009.
  17. Tuccimei P., Mollo S., Soligo M., Vinciguerra S., Castelluccio M., Experimental study on radon emission from rocks under mechanical stress. Implications for volcanic and seismic surveillance, Geotalia, Rimini, Italy, September 2009.
  18. Mollo S., Vinciguerra S., Iezzi G., Iarocci A., Weakening mechanism at Mt. Etna volcano: implications for its eastern flank instability, Geotalia, Rimini, Italy, September 2009.
  19. Vinciguerra S., Del Gaudio P., Mollo S., Iarocci A., Meredith P., Scarlato P., Physical properties of tuffs from Campi Flegrei and Colli Albani Volcanic Districts, Geotalia, Rimini, Italy, September 2009.
  20. Delle Piane C., Vinciguerra S., Mollo S., Rock physics characterisation of the sedimentary basement of mount Etna, Euro Conference of Rock Physics and Geomechanics, Ascona, Switzerland, September 2009.
  21. Mollo S., Vinciguerra S., Iarocci A., Iezzi G., Thermal weakening at Mt. Etna: implications for the volcano instability, Euro Conference of Rock Physics and Geomechanics, Ascona, Switzerland, September 2009.
  22. De Rubeis V., P. Sbarra, P. Tosi and C. Ferrari, Analysis of anisotropic macroseismic fields. Poster presentation, Convegno Annuale dei Progetti Sismologici Convenzione-Quadro INGV-DPC 2007-2009, Roma, Italy, October 19-21, 2009.
  23. Heap M. J., Mollo S., Lavallée Y., Vinciguerra S., von Aulock F.W., Dingwell D.B., Baud P., How Does Temperature Influence the Physical and Chemical Properties of the Deep Carbonate Basement and Shallow Lava Flows at Mt. Etna Volcano?, American Geophysical Union, San Francisco, USA, December 2009.
  24. Vinciguerra S., Mollo S., Iarocci A., Iezzi G., Heap M.J., Temperature induced phase transformations at Mt. Etna (Italy) volcano: implications for the mechanical weakening of the volcanic edifice under magmatic stresses, American Geophysical Union, San Francisco, USA, December 2009.
  25. Nielsen S. B., Schubnel A.J.; Taddeucci J.; Vinciguerra S.; Rao S., Photo-piezometric study of supershear rupture, American Geophysical Union, San Francisco, USA, December 2009.
  26. Trippetta F.; Collettini C.; Vinciguerra S.; Meredith P.G., A non-conventional seismogenic layer in Northern Apennines (Italy): laboratory investigations of physical and elastic properties of the Triassic Evaporites, American Geophysical Union, San Francisco, USA, December 2009.
  27. I. G. Main, J. Greenhough, M. Naylor, A. F. Bell, S. Touati and J. McCloskey. Testing for scale-invariance in extreme events, with application to earthquake occurrence. Frontiers of Seismology, a meeting in Edinburgh for the UK seismology community, 2-3 April 2009.
-

28. I. G. Main, M. Naylor, J. Greenhough, S. Touati, A. F. Bell and J. McCloskey. Are extreme events (statistically) special? Invited talk at AGU 2009.
29. S. Touati. Understanding temporal patterns of earthquake occurrence through interevent times. Institute of Geophysics, ETH Zurich, 5 October 2009.
30. A. F. Bell. Forecasting earthquakes: the state of the art. Disaster Risk Reduction for Natural Hazards: Putting Research into Practice, held at University College London, 4-6 November 2009.
31. J. McCloskey, M. Nic Bhloscaidh, D. H. Natawidjaja, S. S. Nalbant, A. F. Bell, I. G. Main, M. Naylor and J. Greenhough. Probabilistic estimation of slip on historical subduction earthquakes and the longevity of interplate coupling distributions. AGU 2009.
32. J. McCloskey, S. S. Nalbant and A. F. Bell. The September 2009 Padang earthquake and implications for seismic risk in western Sumatra. AGU 2009.
33. J. Heierli, Anticracks: A new theory of fracture propagation and fracture initiation in snow, International Snow Science Workshop, Whistler, Canada, 21-27 Sept. 2008.
34. M. Zaiser, Shear failure of thin films on disordered substrates: Nucleation and propagation of interfacial shear cracks. 4th International Conference on Multiscale Materials Modelling, Tallahassee, USA, October 27-31, 2008.
35. M. Zaiser, Size Dependence in Constrained Plasticity: Discrete and Continuum Models of 3D Dislocation Dynamics, 4th International Conference on Multiscale Materials Modelling, Tallahassee, USA, October 27-31, 2008.
36. M. Zaiser, Fluctuations and size effects in nanoscale plasticity. Workshop on Small-Scale Mechanical Behavior of Synthetic and Biological Structures, Barcelona, September 24-26, 2008.
37. J. Heierli, Crack Nucleation in Thin Films on Disordered Substrates, 7th Int. Conf. on Numerical Analysis and Applied Mathematics, Rethymno, Greece, Sep. 18-22, 2009.
38. P. Tosi, Statistiche spaziali e temporali della sismicità, Dipartimento di Statistica, Università di Roma La Sapienza, December 2, 2008.
39. MMM2008, Tallahassee, Florida (Oct 27-31), Mikko Alava, Lasse Laurson 12th International Conference on Fracture ICF 2009, Ottawa, July 12-17 2008
40. Mikko Alava, Juha Koivisto, Xavier Illa, ICNAAM 2009, Rethymnion, Crete, 18-22 September 2009
41. Amitrano, D. "Microseismic monitoring of rocky cliff: what can we expect from?" Permasense meeting, Zurich, October 15 2009, Invited talk.
42. Amitrano, D., and D. Schorlemmer. "Relationship between friction and earthquake statistics: evidences from experimental and numerical investigation and application to the Earth's crust seismicity", EGU General Meeting, Geophysical Research Abstracts 11, 7018, Vienna 2009.
43. Amitrano, D., M. Arattano, M. Chiarle, G. Mortara, C. Occhiena, M. Pirulli, C. Scavia. "Microseismic activity analysis for the study of the rupture mechanisms in unstable rock masses", EGU General Meeting, Geophysical Research Abstracts 11, 3642, Vienna 2009.

44. Amitrano, D. "Triggering and failure precursory patterns of gravitationnal instabilities, lessons from microseismic monitoring". Triggering of Rapid Mass Movements in Steep Terrains - Mechanisms and Risks, 11 - 16 April, Monte Verita, Ascona, Switzerland, 2010, Invited talk.
  45. Girard L., D Amitrano and J Weiss, "Progressive damage, scaling and critical phenomena toward failure" in EGU General Meeting, Vienna (2010).
  46. Grasso J-R, "Interactions between seismicity and volcano activity", invited talk, ESF-FWF Conference "New Challenges In Earthquake Dynamics" Obergurgl, Austria 18-23 October 2008
  47. Grasso J-R , C.Voisin, F. Renard, E. Larose, D. Zigone, "Lab scale profile of a continuum from quake to slow-silent slips and NVT" invited talk, American Geophys. Union, Meeting, San Francisco, U.S.A., 13-18 December 2009
  48. Grgic, D. and D. Amitrano, "Impact of hygrometry changes on creep behaviour of a porous rock and associated acoustic emission", EGU General Meeting, /Geophysical Research Abstracts 11, 8548, Vienna 2009
  49. Helmstetter, A., and B. E. Shaw, "Earthquake triggering by stress changes: observations and modeling using the rate and state friction law", ESF-FWF Conference "New Challenges In Earthquake Dynamics" Obergurgl, Austria 18-23 October 2008 (Invited talk).
  50. Helmstetter A., L. Sanchez, S. Garambois, J.-R. Grasso, F. Doré, Y. Orengo, J.-P. Duranthon, P. Pothérat and J. Kasperski, "Suivi multidisciplinaire du mouvement de terrain de Séchillienne" Journées "Aléa Gravitaires", Orléans 17-18 November 2008
  51. Helmstetter A., L. Sanchez, S. Garambois, J.-R. Grasso, F. Doré, Y. Orengo, J.-P. Duranthon, P. Pothérat and J. Kasperski, "Micro-seismic monitoring of the Séchillienne rockslide", Workshop on "Micro and nano-seismic monitoring of landslides", Strasbourg, 9th December 2008 (Invited talk).
  52. Helmstetter A. and Shaw, B., "Earthquake triggering by stress changes: Observations and modelling using the rate and state friction law". International School on Complexity, 11th Course: "Grains, Friction, and Faults", Erice, Italy, 20-25 July 2009 (Invited talk).
  53. Helmstetter, A, "Earthquake triggering by stress changes: Observations and modeling using the rate and state friction law" Workshop on Fluctuations in Materials Properties, Courmayeur, Italy, January 2010 (Invited talk).
  54. Lacroix, P. , A. Helmstetter, S. Garambois, J.R. Grasso, "Localisation des sources sismiques sur le glissement de terrain de Séchillienne", GdR TransNat, Roscoff, November 2009
  55. Levy, C., D. Amitrano, L. Baillet, "Frequency analysis of rock cliff collapse seismic precursors and numerical modeling", EGU General Meeting, Geophysical Research Abstracts 11, 8476, Vienna 2009.
  56. Tatard, L., J.-R. Grasso and A. Helmstetter, "Comportement des glissements de terrain en temps, taille et espace dans différents contextes", Journées "Aléa Gravitaires", Orléans 17-18 November 2008
  57. Tatard, L., J.-R. Grasso, A. Helmstetter and G. Dellow, "Time pattern of New Zealand landslides", Joint Geological and Geophysical Societies Conference, Wellington, New Zealand, November 2008.
-

58. Tatard, L., J.-R. Grasso "Testing earthquake triggered landslides against earthquake aftershocks for space distributions", International Conference in Commemoration of the 10th Anniversary of the 1999 Chi-Chi Earthquake, Taiwan, September 2009.
59. Werner, M.J., A. Helmstetter, D.D. Jackson and Y.Y. Kagan (2009), "Long-Term Earthquake Forecasts for California and Italy", Geophys. Res. Abstracts, EGU annual meeting, Vienna, Austria, April 2009.
60. Werner, M.J., A. Helmstetter, D.D. Jackson and Y.Y. Kagan (2009), "High Resolution Long- and Short-Term Earthquake Forecasts for California", International Symposium on "Earthquake Seismology and Earthquake Predictability", Beijing, China, July 2009
61. Alberto Petri IMA Conference on Dense Granular Flow Cambridge 5-9 January 2009 Cambridge, UK
62. Alberto Petri "Stick-slip dynamics of a granular medium", Acoustics'08, Parigi (France), 29 June-4 July 2008 (invited)
63. Alberto Petri "Stochastic approach to chaotic stick slip" 6th International Discussion Meeting on Relaxations in Complex Systems, Rome (Italy), August 30<sup>th</sup> - September 5th 2009 (invited)

## 2.6 Tutorials

## 2.7 Conferences, Workshops and Summer Schools

### 2.7.1 Completed Actions

1. "International Snow Science Workshop 2009" in Davos, 27 September – 2 October 2009. The aim was to gather scientists and practitioners in the field of snow safety under the motto of "A merging of theory with practice". 500+ participants from 24 countries attended the conference. (WSL/SLF)
  2. II Cell Model Systems Summer School, Roma-Tor Vergata (Italy), 7-12 June, 2009 (CNR). Erice International School on Complexity, XI Course: Grains, friction and faults Erice (Italy) July 20th 25th (CNR). XIV Convegno Nazionale di Fisica Statistica, Parma, 24-26 Giugno 2009 (CNR).
  3. 8<sup>th</sup> Euro Conference of Rock Physics & Geomechanics, 13th - 18th September, 2009, Ascona, Switzerland (INGV).
  4. New challenges in earthquake dynamics: Observing and modelling a multi-scale system. Obergurgl, Austria 18-23 October 2008. The aim of this conference is to discuss the recent advances in earthquake physics, in particular relating to earthquake interactions (observations, models). An emphasis will be given on the role of small scale processes and structures in controlling large scale earthquakes and regional seismicity. It will promote new, exploratory discussions on how to reconcile large scale regional models with small-scale controls on stress and seismicity (UJF)
  5. "Frontiers of Seismology": a meeting for the UK seismological community in Edinburgh, Co-hosting , 2-3 April 2009, covering all aspects of Earthquake and Exploration Seismological Research (UEDIN).
  6. "International Snow Science Workshop 2009" in Davos, 27 September – 2 October 2009. The aim was to gather scientists and practitioners in the field of snow safety under the motto of "A merging of theory with practice". 500+ participants from 24 countries attended the conference (WSL/SLF).
  7. Symposium of Multiscale Materials Modeling 2008 in Tallahassee, Florida, Oct. 2008 (HUT).
  8. PhD Course, "Introduzione alle variabili aleatorie e ai sistemi complessi", Università Roma Tre (CNR).
  9. Master Course on "Snow and Avalanches" at ETH Zurich, Switzerland (WSL/SLF). Educational Courses (2-3) for avalanche professionals (per year), in total about 300 participants (WSL/SLF).
  10. Phd seminar "Spatial and temporal statistics of seismicity", Statistics department, Università Roma Sapienza, December 2008 (INGV).
  11. 'NANIA' meeting on complexity, Royal Society of Edinburgh, 2008 (Main) (UEDIN)
  12. 'Frontiers in seismology', Our Dynamic Earth, Edinburgh, 2009 (Main, Bell) (UEDIN)
-

13. AGU Chapman Conference on 'Complexity and Extreme Events', Hyderabad, India, 2010 (Main) (UEDIN)
14. MMMM2008 Symposium, Tallahassee, Florida (Oct 27-31) (HUT)
15. XIII Convegno Nazionale di Fisica Statistica e dei Sistemi Complessi Parma (Italy) , 23-25 Giugno 2008 (CNR)
16. Erice International School on Complexity XI Course: Grains, friction and faults Erice (Italy), July 20th 25<sup>th</sup> 2009 (CNR)
17. XIV Convegno Nazionale di Fisica Statistica e dei Sistemi Complessi Parma (Italy), 24-26 Giugno 2009 (CNR)

### **2.7.2 Planned actions**

## 2.8 Press release (press/radio/TV)

### 2.8.1 Press and Web

1. INGV. The internet site [www.haisentitoilterremoto.it](http://www.haisentitoilterremoto.it), made by INGV group, gave the opportunity to be in contact with people. In the site it is possible to compile a questionnaire about earthquake effects addressed to a single non-specialist person; reported effects are statistically analyzed to extrapolate Mercalli-Cancani-Sieberg and European Macroseismic Scale intensity referred to that observer. Maps of macroseismic intensity are displayed on-line in almost real time and are continuously updated. Collected data are analyzed with the aim of studying attenuation and amplification anomalies of the shaking. Through the site INGV collected over 130000 questionnaires and more than 8000 permanent subscribers. This voluntary collaboration brought the interest and awareness of citizen in earthquakes, stimulating the debate on some hot topic. Media interview and articles dealt in particular with: factors acting on amplification of earthquake effects, opportunity given to every person to contribute in a scientific research, connection between earthquakes occurring close in time but at long distance apart (as example Forlì 05 April 2009 and L'Aquila 06 April 2009).
2. INGV. Press release Adn Kronos (2009-04-25), Terremoto, quasi 10mila risposte al questionario on-line. Dati utili per la prevenzione (INGV).
3. Press release ANSA (2009-04-06 ), L'INGV stila la 'Mappa delle percezioni' in tutta Italia (INGV).
4. Press article Corriere della Sera (2009-04-06), Hai sentito il terremoto? Sito scientifico calcola le mappe della scossa percepita (INGV).
5. Press article Corriere della Sera (2009-02-02), Sta nascendo una comunita' di cittadini pronti a fornire informazioni in caso di scosse per aiutare i sismologi. [http://www.corriere.it/scienze\\_e\\_tecnologie/09\\_febbraio\\_02/osservatori\\_terremoti\\_f\\_oresta\\_martin\\_791aa8c0-f146-11dd-b48f-00144f02aabc.shtml](http://www.corriere.it/scienze_e_tecnologie/09_febbraio_02/osservatori_terremoti_f_oresta_martin_791aa8c0-f146-11dd-b48f-00144f02aabc.shtml) (INGV).
6. On-line press article GEO Media (2009-04-24), Mappe collaborative degli effetti del terremoto da INGV, <http://www.rivistageomedia.it/it/ambiente-e-territorio/1285-mappe-collaborative-degli-effetti-del-terremoto-da-ingv.html> (INGV).
7. On-line press article Unione Giornalisti Italiani Scientifici (2008-12-20), [www.haisentitoilterremoto.it](http://www.haisentitoilterremoto.it) - a disposizione dei cittadini per le loro segnalazioni, <http://www.ugis.it/a180109-terremoto2.html> (INGV).

### 2.8.2 Radio

1. INGV. Interview with Valerio De Rubeis (INGV) on Radio 1 (2010-01-26 ), Subject: web site [www.haisentitoilterremoto.it](http://www.haisentitoilterremoto.it).  
[http://www.radio.rai.it/grr/view.cfm?Q\\_PROG\\_ID=421&Tematica=17&V\\_IDNOTIZIA=57028#](http://www.radio.rai.it/grr/view.cfm?Q_PROG_ID=421&Tematica=17&V_IDNOTIZIA=57028#)  
  
Interview with Valerio De Rubeis (INGV) on Radio 3 scienza (2009-01-29), Subject: sito web [www.haisentitoilterremoto.it](http://www.haisentitoilterremoto.it). [podcasthall.forumcommunity.net/?t=34284455](http://podcasthall.forumcommunity.net/?t=34284455)  
  
Interview with Valerio De Rubeis (INGV) on Radio 3 scienza (2008-12-23), Subject: Parma earthquake 23 december 2008.

### 2.8.3 TV

1. UEDIN Several interviews with journalists in the wake of the Haiti earthquake, including *New Scientist* and *The Engineer* (Main)
2. INGV. Interview with Patrizia Tosi (INGV) on Sky TG24 (2010-01-15), Subject: Haiti earthquake.
3. INGV. Interview with Patrizia Tosi (INGV) on Rai3 (2009-04 ), Subject: L'Aquila earthquake.
4. INGV. Interview with Valerio De Rubeis (INGV) on Sky TG24 (2009-04 ), Subject: L'Aquila earthquake.
5. WSL-SLF. BBC film teams were shooting footage in February and December 2009 of the WSL/SLF fracture experiments and snow micro-penetrometer measurements to be included in a production on avalanches (Invisible Worlds).
6. CNR Intervista a Tor Vergata TV (December) 2009  
[http://www.torvergata.tv/tv/engine.asp?id\\_mnu\\_macro=8&id\\_area=&clipID=789](http://www.torvergata.tv/tv/engine.asp?id_mnu_macro=8&id_area=&clipID=789)

## **2.9 Demonstrations in Industrial and Scientific Exhibitions**

### **2.9.1 Completed actions**

None

### **2.9.2 Planned actions**

None

### **2.9.3 TRIGS Project Web-site**

#### **2.9.4 Completed actions**

The project communication infrastructure was set up by the end of March 2007 as expected. In particular a web page is active at <http://www.trigs.eu/>. The domain name has been registered for this purpose. The web interface is based on a versatile platform (WordPress) that allows remote users to modify its content. This is particularly useful to rapidly update the informations by all the teams.

We have also implemented a collaborative web-space to allow for exchange of scientific information and research results between the teams (see <http://trigs.artov.isc.cnr.it/twiki/bin/view/TRIGS/WebHome>). The popular 'twiki' platform was chosen for its versatility and ease-of-use and usage, so far, is encouraging. The content is restricted to TRIGS participants only.

#### **2.9.5 Planned actions**

The dissemination strategy with regard to the project website and twiki collaboration platform has been very effective so far and we thus plan to continue on the same line.

## **2.10 Dissemination actions toward the other projects of the Tackling Complexity Initiative**

There are presently no actions geared toward the Tackling Complexity Initiative.

## **2.11 Other dissemination actions**

Exchange: Claudio Manzato (Zapperi group): 2 months in Helsinki in 2009 (HUT).

Training: PhD student Torbjorn Ersfjors Bjork, Physics of Geological Processes (PGP), University of Oslo, for micro analytical facilities field emission SEM (INGV).

Thesis: Moretti S., degree, Radon exhalation rate of geological materials and its relation to temperature and deformation degree, University "Roma Tre" (Rome, Italy). Tutor: P. Tuccimei, S. Vinciguerra. (INGV).

Thesis: Heap M., PhD, CREEP: time-dependent brittle deformation in the laboratory, University College London, Supervisors: Meredith P.G., Baud P., Vinciguerra S. (INGV).

Thesis: Trippetta F., PhD, Physical properties of seismogenic Triassic Evaporites in the northern Apennines (Central Italy), Università di Perugia, Supervisors: Collettini C., Vinciguerra S. (INGV).

Ian Main was a member of the International Presidential commission on Earthquake forecasting for civil protection, set up in the aftermath of the L'Aquila, Abruzzo earthquake in 2009. Interim recommendations were presented to the Italian civil protection organisation and to the press direct, including a press conference in L'Aquila itself. A key issue was the

possible enhancement of seismic hazard due to triggering effects during a local swarm that preceded this event. (UEDIN)

Popular Science: Heierli, M. Zaiser, P. Gumbsch, Der Knall im Lawinenhang, Physik in unserer Zeit Vol. 41, 31 (2010), Wiley-Interscience, doi:10.1002/piuz.201001224. (UEDIN)

General public articles:

Birkeland, K.; Schweizer, J.; Jamieson, B., 2009. Fracture Propagation: Recent Research and Implications. *Avalanche Rev.* 27, 4: 28-29, 32. (SLF)

Schweizer, J., 2008. Profilinterpretation. In: Zweifel, B. (ed) *Lawinenunfälle in den Schweizer Alpen. Winter 2005/06. Personen- und Sachschäden.* Davos, Eidg. Institut für Schnee- und Lawinenforschung SLF. 129-132. (SLF)

Schweizer, J., 2009. Interpretation von Schneedeckenuntersuchungen. In: Mair, P.; Riedl, H. (eds) *Ausbildungshandbuch der Tiroler Lawinenkommissionen.* Innsbruck, Amt der Tiroler Landesregierung. 120-129. (SLF)

Schweizer, J.; van Herwijnen, A., 2008. Auslösung von Schneebrettlawinen. *FAN-Agenda* 2/08: 15-16. (SLF)

We advertised TRIGS results on Public Service – European Union, Issue 18, September 2009.