



STRUCTURAL AND RHEOLOGICAL CONSTRAINTS ON MAGMA MIGRATION, ACCUMULATION AND ERUPTION THROUGH THE LITHOSPHERE

Leaders: Joan Martí (Spain) and Alessandro Tibaldi (Italy)

Co-Leaders: Donald Dingwell (Germany), Joachim Gottsmann (UK)

Project summary

Volcanism is a geological process that has significant socio-economic implications due to its short and long term associated hazards, which include their direct impact but also potential global atmospheric effects. Therefore, understanding the causes and effects of volcanism is of major importance to minimise its risks. Deciphering how volcanism works and how we can anticipate the occurrence of volcanic eruptions, require first to fully understand how its main driving force, magma, forms, evolves and moves across the lithosphere. This project proposes an innovative approach to quantify the structural and rheological controls of magma migration and accumulation into the lithosphere by promoting networking among a large number of research groups with diverse expertise, contributing to the development of multidisciplinary knowledge on such complex subject and, thus, to better understand volcanism and to mitigate its related hazards.

Rationale of the project

In the Earth System, volcanism is one of the more complex geological processes as it involves the generation of magma in the mantle or lower crust, its ascent, accumulation and differentiation through the lithosphere, and finally its eruption at the surface. Moreover, ejection of volcanic products involves interaction with processes of atmospheric dynamics and circulation. These processes have diverse time scales and end with volcanic eruptions that may impose a serious threat to society, which is becoming more and more vulnerable to volcanic impacts (e.g.: 2010 eruption of Eyjafjallajökull volcano in Iceland) due to its highly technological dependency and rapid demographic development. How magma will move and evolve through the lithosphere will determine whether it will erupt or not, so understanding magma migration and accumulation processes is crucial to comprehend also volcanism and to constrain associated hazards. However, understanding magma dynamics is a very complex task that cannot be undertaken by a single group of experts, as it requires a multidisciplinary study that combines techniques and concepts from various geological and geophysical disciplines. The study and characterisation of the relationships between plutonic and volcanic processes is one of the most debated topics in the modern Earth Sciences. Both processes have traditionally been studied separately, but in recent years they are increasingly considered as a single system, which bears important implications in the study of lithospheric processes, the formation of mineral deposits associated with siliceous magmas, the formation and dynamics of geothermal reservoirs, and in volcanic hazard and risk assessment.

The proposed ILP project pretends to promote networking at a global level in order to merge all the expertise required to understand and quantify the structural and rheological constraints on magma migration and accumulation in the lithosphere, as a further step to understand volcanism and its potential risks. This ILP project aims to facilitate a discussion forum on the present state of knowledge on magmatic processes as part of the Earth System Science, and to improve knowledge on the pre-eruptive conditions of magmas. With this effort we also want to contribute to define the guidelines to address future research on such subject in a more precise way and to optimise its application to the management of volcanic hazards and risks.

Specific subjects of the research and deliverables

This project focuses on the study of four key topics that correspond to the four steps of magma process: magma generation, ascent, emplacement and eruption. The first step is related to the generation of magma in deep regions of the lithospheric mantle and the continental crust. The second is related to the ascent of magma from the source region through the lithosphere. The third is the accumulation of magma in shallow reservoir where crystallisation may lead to formation of plutons and eventually to volcanic eruptions (fourth step). It is broadly accepted that these steps of the magma mass transfer process are closely related to tectonic activity, i.e. the relative motions of lithospheric plates and their effects. Treated separately, each of

these specific issues constitutes the topic of important geological, geochronological, experimental and structural studies. Although the connection between the discussed aspects is indisputable, their complexity makes very difficult to address them jointly, unless by favouring the dialogue between various scientists with diverse skills and creating a multidisciplinary network, as here proposed. We will spend our efforts to improve future investigations by linking multiple research approaches and technologies. We will organize international teams of scientists that will work in collaboration on: structural field, laboratory and numerical studies, combined with stratigraphic, petrological, geochemical, geophysical and geochronological methods, to more precisely understand the complex interplay between stress field, deformation types and location, and magmatic activity.

More in detail, the action will focus on the following specific sub-objectives: 1) definition of mechanisms, time scale and periodicity of magma supply in different geodynamic settings; 2) definition of rates and magma volume transfer between different parts of the magmatic system; 3) characterisation of mechanism of interactions between magma and host rock within intermediate parts of the plumbing system (lower-upper crust); 4) characterisation of the parameters that guide the structure and dynamics of the shallower part of the plumbing systems (first few kilometres); 5) study of the mechanisms that lead to the arrest of ascending magma or to eruption; 6) definition of the relationships between the above processes and the eruptive style, magnitude and intensity of eruptions, eruptive scenarios and associated hazards; 7) recognition of eruption precursors and improvement of monitoring actions.

To contribute to these specific sub-objectives, our teams will use integrated field and laboratory works. Numerical simulation and experimentation have provided a conceptual basis of pre-eruptive processes; experimentation on phase relations in thermal gradients has been used to understand the crystallisation and differentiation of magma chambers, being this an important aspect to understand eruption dynamics and related hazards. Geophysical and geochemical monitoring tools provide a variety of information that needs to be interpreted as magma movement and/or as interaction of magma with host rocks. Similarly, intensive thermodynamic variables (e.g. P, T and composition) are recorded in the texture and composition of erupted products that can be better understood by a combination of petrological and physical volcanological methods. Similarly, coupling geophysical and geochemical signals with petrologic and physical volcanology constraints yields a terrific advancement in the understanding of magma dynamics and improves our forecasting capability.

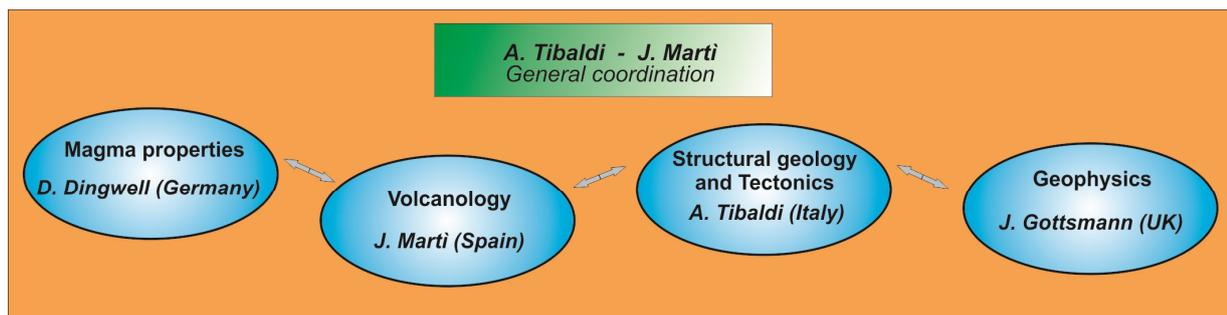
The main deliverables of the project will be a set of conceptual models on magma production, ascent and storage in the lithosphere, which will consider the coupling between host rock and magma in different tectonic settings, and will try to explain in a quantitative way the preparation of a new eruption. In fact, for most of the volcanoes, even the better monitored and studied, these aspects are still unknown or affected by a large uncertainty.

Novelty of the project

We foresee to develop unprecedented synergies between different teams with distinct but complementary expertise, toward a unique objective of quantifying the origin, volume, mechanism and duration of magma movement from mantle to the surface. The novelty of the project lies on the fact that we propose to study Earth magmatism from a joint and global perspective, rather than from the point of view of each expert or scientific interest. This joint approach will allow us to contribute to the understanding of the relationships among all the physico-chemical and thermo-dynamic processes and the tectonic control affecting magma genesis and evolution. This approach will provide a global perspective in relation to lithospheric dynamics, and a better understanding of intrusive-volcanism relations. Moreover, it might have a positive feedback on the knowledge of other processes such as crustal evolution and formation of ore deposits. The different views and expertises provided by each participant in the project will allow us to construct more realistic models on magma transport and volcanism.

Structure and management

The project will be coordinated by Prof. Joan Martí (CSIC, Barcelona, Spain) and Prof. Alessandro Tibaldi (University of Milan-Bicocca, Italy) and will have two additional co-Leaders: Prof. Donal Dingwell (University of Munich, Germany) and Dr. Joachim Gottsmann (University of Bristol, UK). Each one will be responsible for a different section of the project as depicted in the following scheme:



Methodologies

As the main aim of this project is to promote networking at international level to develop innovative research in one of the main aspects of Earth Science, the project activities have therefore been carefully planned in order to facilitate effective cooperation between the partners during its whole duration. This is particularly critical in the present structure of the project due to the requested high synergy between the various participants and the different but complementary tasks they have to undertake. Several thematic workshops and short-term scientific missions among the different participants will be scheduled in order to ensure cooperation. An intense use of modern dialogue techniques, such as videoconferencing, will allow a continuous harmonization among the four coordinators and with all participants. Each participant must know the contribute to the various research themes done by the others and the new initiatives. This will allow also to recognize possible missing parts in the whole research, in order to reorient it and to involve further specific needed skills. A project website will be developed in the first four months of the project, updated along the whole project duration, and maintained also after its closure, in order to spread information and for dissemination purposes, together with a data repository. Organization of sessions at international, well recognized meetings is envisaged. Input data to develop the research in this project will come from published data, field surveys, experimental petrology, experimental and numerical modelling (including supercomputing and 3D visualisation) on lithosphere dynamics, rock and magma rheology, rock mechanics and fluid dynamics, in order to reproduce the main tectono-magmatic processes that allow the formation of magma and its migration, storage and evolution inside the lithosphere. We will use selected examples from different tectonic settings, of both active and extinct volcano-magmatic complexes, in order to cover the wide spectrum of Earth magmatism and volcanism.

Relevance of the project for goals and program themes of the ILP and ICSU scientific unions

ILP offers the perfect framework for this project, as ILP “*seeks to elucidate the nature, dynamics, origin and evolution of the lithosphere through international, multidisciplinary geoscience research projects and coordinating committees*”. Processes such as tectonism, magmatism and volcanism are all themes classically developed under the umbrella of ILP. These also are among the main themes of the IUGG and of the IUGS. These themes will be here studied with emphasis on their inter-relations. Key sites will be selected from most of the continents, representing all the possible geodynamic settings. Hence, we believe that the objectives here proposed address practical problems that involve two of the four main program themes of the ILP, notably: *Geodynamics and Deep Processes*, and *Continental Lithosphere*. At the same time, this project will also foster mutual cooperation between IUGS, IUGG and IAVCEI. The expected benefits of the project are mostly scientific as it addresses a basic research aspect, but we envisage also significant societal benefits as the results obtained will be applied to improve our ability to forecast volcanic eruptions and, consequently, to reduce volcanic risks. This project is international, really interdisciplinary, and inter-institutional. It will promote basic and applied science, providing results of worldwide significance and applicability.

Timetable and plans of the research

We propose a five-years Task Force project, during which the four coordinators of the main themes will foster collaboration and exchange of ideas and data among the participants. As any other ILP project, the present one will promote networking tools, emphasising in particular the celebration of a series of thematic workshops on the different scientific topics included in the project, training schools addressed to young

PROJECT PROPOSAL FOR ILP 2015-2019

researchers on the different scientific disciplines covered by the project, short-term scientific missions, and dissemination activities.

1st year (2015): Data collection from some key sites; analogue and numerical modelling of the various phenomena. Set up of a website dedicated to the project. Start-up meeting (September 2015) in Potsdam with Leaders and Co-Leaders of this TF, in conjunction with the ILP general meeting “35 years of ILP”. Organization of sessions at the EUG, IUGG and AGU meetings. Preparation of joint research projects.

2nd year (2016): Data collection; improvements to modelling. Meeting in Milan (February 2016) with Leaders and Co-Leaders of this TF for coordination and verifying of advancements. Publication of results. Website updating. Organization of sessions at the EUG, AGU and other meetings. Workshop and training school in summer 2016. Preparation of joint research projects.

3rd year (2017): Field data collection within an expanded international co-operation; improvements to modelling. Publication of a special issue on an international journal. Website updating. Organization of sessions at IAVCEI Scientific Assembly and other Earth Science meetings. Workshop and training school in summer 2017. Preparation of interdisciplinary research projects.

4th year (2018): Data collection and modelling within an expanded international cooperation. Publications. Updating and maintenance of the website. Session organisation at various meetings. Preparation of interdisciplinary research projects.

5th year (2019): Data collection and modelling within an expanded international cooperation. Publication of a special issue on an international journal. Updating and maintenance of the website. Concluding workshop.

Researchers and Countries involved (who have already accepted) and Groups of work:

Participant	Institution	Country	Group of work
Joan Martí Alessandro Tibaldi Derek Rust Andres Folguera Alexandru Szakács	CSIC University of Milan Bicocca University of Portsmouth Universidad de Buenos Aires Sapientia University	Spain Italy UK Argentina Romania	Field structural geology and tectonics
Fabio Bonali, Claudia Corazzato Valerio Acocella August Gudmundsson Benjamin Van Wyk de Vries	University of Milan Bicocca University of Milan Università di Roma Tre The Royal Holloway Université Blaise Pascal	Italy Italy Italy UK France	Analogue and numerical modelling
Donald Dingwell, Ulrich Harms Alessandro Cavallo Paola del Carlo Sergio Rocchi Antonio Castro	University of Munich Potsdam, GFZ University of Milan Bicocca INGV-Pisa University of Pisa University of Huelva	Germany Germany Italy Italy Italy Spain	Petro-chemistry and rheology of magmas
Jurgen Neuberg Andrea Rovida Andrey Koryenkov Gulam Babayev Lauren Schafer Joel Ruch	University of Leeds INGV-Milan Institute of Geology Geology Inst. of Azerbaijan Michigan Tech. Univ. King Abdulaziz University	UK Italy Russia Azerbaijan USA Saudi Arabia	Seismology and interpherometry
Fakhraddin Kadirov Joachim Gottsmann, Greg Waite Aleksy Smirnov Simon Carn Jaume Pous	Nat. Academy of Sciences University of Bristol Michigan Tech. Univ. Michigan Tech. Univ. Michigan Tech. Univ. University of Barcelona	Azerbaijan UK USA USA USA Spain	Geophysics

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Malcolm Whitworth Alexander Strom John Gierke Thomas Oommen	University of Portsmouth Institute of Geology Michigan Tech. Univ. Michigan Tech. Univ.	UK Russia USA USA	Geological engineering
Armann Hoskuldsson Páll Einarsson Ásta Rut Hjartardóttir Ioan Seghedi Alfredo F.M. Lagmay Bill Rose Greg Valentine Luis Lara	University of Iceland Haskoli Islands University Haskoli Islands University Sapientia University University of the Philippines Michigan Tech. Univ. Univ. of New York at Buffalo SERNAGEOMIN	Iceland Iceland Iceland Romania Philippines USA USA Chile	Volcanology and related hazard assessment
Paolo Oppizzi Federico Aligi Pasquarè	Gole della Breggia Geopark University of Insubria	Switzerland Italy	Communication strategies
Paraskevi Nomikou	University of Athens	Greece	Marine geology

CV Task Force Leader

Prof. Alessandro TIBALDI, Ph.D.

Born in Milan, Italy, 1961.

Address: Department of Earth and Environment Sciences, University of Milan-Bicocca, Milan, Italy;

e-mail: alessandro.tibaldi@unimib.it, tel. 0039 0264482052; Web-site: <http://www.geo.unimib.it/>

Languages: English (fluent, written and spoken), Spanish (fluent, written and spoken), Italian (mother tongue).

PRESENT AND ADJUNCT POSITIONS

- **Professor** of “Structural geology”, “Neotectonics and volcano-tectonics”, and “Field mapping”, at University of Milan-Bicocca;
- 2013 **habilitation as full professor** in Structural geology, National Scientific Habilitation Procedure 2012;
- Since 2010: **Ad-hoc Graduate Faculty**, Dept. Geological/Mining Engineering and Sciences, Michigan Technological University, USA;
- Since 2008: **Erasmus Professor** at Portsmouth University, United Kingdom.

PUBLICATIONS

h-index: 22 (ISI-Wok); **Papers on peer reviewed international journals** (with IF): 110; **International Books & Encyclopedia Chapters:** 12; **Proceedings:** 17; **Congress abstracts:** 95; **Invited Presentations, Short Courses and Workshops:** 23.

EDITORSHIPS

- Since 2014 **Review Editor** of **New Frontiers in Volcanology**, Nature Publishing Group;
- 2012 **Guest Editor** (together with S. Cloetingh) of **Journal Global and Planetary Change**, Special issue: “From the lithosphere to the surface: processes, hazards and resources”;
- 2006 **Guest Editor** (together with A.F.M. Lagmay) of **Journal Volcanology and Geothermal Research**, Special issue: “Interaction Between Volcanoes and Their Basement”.

HONORS & AWARDS

- 2007, **Elsevier Award** for the “2003-2007 most cited paper on Tectonophysics”;
- 2000 “**A. Volta Award**” for Scientific Researches in European and extra-European mountain belts;
- 1999-2012, **Fellows** of the “Institute for Dynamics of Environment Processes”, National Council of Researches;
- 1991 “**Edward A. Flinn Award**” of the International Lithosphere Program;
- 1988 “**M. Oxilia 1987-1988 Award on the Geology and Structure of the Alps**”, Geological Society of Italy.

COORDINATOR OF RESEARCH GRANTS

2013-15 **MIUR-National Program Antarctic Research:** “Origin and dispersion of volcanic ashes in the austral hemisphere: a data base for volcanology, chronostratigraphy and palaeoclimate of Earth System”; 2013-14 **European Union Intensive Program Erasmus:** “Integrating field classical and new methodologies for geological hazard assessment and communication”; 2010-14 **International Lithosphere Program:** Task Force II “Volcanoes and society: environment, health and risk”; 2009-14 **Transatlantic project USA-EU Atlantis:** “International collaboration and teaching in Volcanology and Engineering geology”; 2008-10 **NATO - Science for Peace:** “Geo-environmental security of the Toktogul hydroelectric power station region, central Asia”; 2009 **MIUR - Internationalisation of Research:** “Earth Sciences for renewable energetic resources: Italy-Argentina”; 2006-07 **MIUR:** “Structure of the Nisyros (Greece) resurgent caldera; 2005-07 **Member of the Italian National Committee** of coordination of all the Italian research projects on active volcanoes under the INGV – Civil Protection Agency agreement; 2005-07 **Civil Protection Agency - INGV:** “Research and monitoring of Stromboli and Panarea volcanoes”; 2005-09 **International Lithosphere Program:** Task Force II “New tectonic causes of volcano failure and possible premonitory signals”; 2003-05 **NATO-CLG:** “A multidisciplinary approach to recent geologic catastrophes at subduction zones”; 2003-04 **MIUR:** “Structure of Cotopaxi volcano (Ecuador) and past collapses”; 2003-04 **National Civil Protection - Stromboli volcano emergency:** “Analysis of magma paths and dykes”; 2001-05 **International Geological Correlation Program:** “Effects of basement structural and stratigraphic heritages on volcano behaviour and human activities (n. 455)”; 2001-04 **FIRB-MIUR:** “Volcano lateral collapses and mineral resources”; 2000-07 **GNV:** “Lateral collapses at Stromboli Volcano”; 1998-02 **National Geological Survey-CNR:** “Prototype geological map of Stromboli Volcano; 1996-2000 **CNR:** “Reconstruction of neotectonics for seismic hazard in the Southern Andes of Colombia”.

CV Task Force Leader
Prof. Joan MARTI, PhD

Date of birth: February 19th, 1957
Present position: Professor of Research (since June 2001)
Organisation: National Research Council of Spain, CSIC
Address: Institute: Institute of Earth Sciences Jaume Almera
Department: Geophysical and Geological Modelling and Geohazards
Lluís Solé Sabaris, s/n
08028, Barcelona, Spain
e-mail: joan.marti@ictja.csic.es

Studies and degrees:

B.Sc. in Geology, Faculty of Geology, University of Barcelona, 1979.
B.Sc. Honours in Geology, University of Barcelona, 1982
Ph.D: Geological Sciences, University of Barcelona, 1986

Previous positions

- 1981-1986 Assistant Professor, Department of Petrology and Geochemistry, University of Barcelona.
- 1987-1989 Post-Doctoral Research Fellow, Institute of Geology (Jaume Almera), CSIC
- February 1989-January 1999, Tenure Scientist, National Research Council of Spain, CSIC, Institute of Earth Sciences, Barcelona
- January 1999-June 2001, Senior Scientist, National Research Council of Spain, CSIC, Institute of Earth Sciences, Barcelona
- February 1995-March 1998, Head of the Department of Natural Hazards
- Since March 1998, Director of the Laboratory of Simulation of Geological Processes (SIMGEO), CSIC-University of Barcelona.

Relevant responsibilities

Former Secretary of Volcanic Risk Section of the European Geosciences Union (EGU) (2004-2007). Secretary General of the International Association of Volcanology and Chemistry of the Earth Interior (IAVCEI) since 2007. Secretary of the Section of Volcanology of the National Committee of Geodesy and Geophysics since 2007. Member of the Executive Committee of the International Union of Geodesy and Geophysics (IUGG), since 2007. Chief Editor of the Journal of Volcanology and Geothermal Research (Elsevier) since 2007. Associated Editor of the Journal of Natural Hazards and Earth Sciences Studies (NHES, EGU) from 2006 to 2012. President of the International Scientific Advisory Committee of the Service National d'Observation en Volcanologie CNRS-INSU, France, since June 10, 2010. Member of the Executive Committee of the IUGG Commission on Geophysical Risk and Sustainability (GRC) for the period 2011-2015. Member of Editorial Board of the Special Publications of the International Union of Geodesy and Geophysics, Cambridge University Press, since 2012. Coordinator and participant of several EU funded research projects

Publication records

Principal author and co-author of over 240 research papers. Co-editor of the book "Volcanoes and the Environment" (Cambridge University Press, 2005). Co-editor of the book "Caldera Volcanism" (Elsevier 2008).

CV Task Force co-Leader
Dr. Donald Bruce DINGWELL

University of Munich, Born 1958, Citizenship: Germany/Canada

Degrees

B.Sc. Honours : Geology/Geophysics 1980 - Memorial University of Newfoundland

Ph.D. Geology 1984 - University of Alberta

Dr. rer. nat. Habil. Geochemistry 1992 - Universität Bayreuth

D.Sc. (h c mult) 2012 - University of Alberta , University College London

Positions current

Founding Member – Center of Advanced Studies - LMU

Founding Director - Department of Earth and Environmental Sciences

Chair of Mineralogy and Petrology, LMU - University of Munich

Positions past

2011-2013 Secretary General – European Research Council

2007 & 2008 Blaustein Visiting Professor – Stanford University

2006 Visiting Professor – California Institute of Technology

2004-2006 Dean – Faculty of Geosciences

1987-2000 Senior Scientist and deputy director – Bayerisches Geoinstitut

1986-1987 Asst. Professor - Earth and Planetary Sciences – Univ. of Toronto

1984-1986 Carnegie Fellow - Geophysical Laboratory, Carnegie Institution of Washington

Honours (selected)

-Otto SCHOTT Research Award of the Ernst Abbe Foundation (2014)

- Elected member of the German national academy of science and technology - ACATECH (2013)

-Norman L. BOWEN Award of the American Geophysical Union (2013)

-Order of Merit of the Federal Republic of Germany (Bundesverdienstkreuz) (2013)

-elected President – European Geosciences Union – (2011-2013)

- Elected Fellow of the Royal Society of Canada (2010)

- Advanced Researcher Award – European Research Council (2010-2015)

-Fellow of the American Geophysical Union (2009)

-Distinguished Lecturer – Mineralogical Society of America (2008-09)

-Chair of the section of Earth and Cosmic Sciences – Academia Europaea (2008-

- Member European Research Council Advanced Grants Panel (2008, 2010)

- Robert Wilhelm BUNSEN Medal of the European Geoscience Union (2008)

-Elected Member of the Academia Europaea (2007)

-ISI Highly Cited Researcher (world's most cited authors) – Geosciences (2004)

- Fellow of the Geological Association of Canada (1998)

-MSA Award - Mineralogical Society of America (1996)

-Fellow of the Mineralogical Society of America (1995)

-Gerhard-Hess-Research Prize of the German Science Foundation (DFG) (1993-98)

-Victor-Moritz-Goldschmidt-Prize of the German Mineralogical Society (DMG-1991)

-NSERC 1967 Science Scholar – (1980-1984)

Offices in Scientific Societies (Past)

-President of the European Geosciences Union, -founding President of the GMPV Division of EGU, -Director – Geochemical Society, -Councillor – Mineralogical Association of Canada, -Secretary – VGP section of the AGU.

Scientific Output

Ca. 350 refereed papers, ca. 10,000 ISI Citations, h-factor 50 (01.03.14)

Advisory Roles

Editorship of intern. journals, 9 (past) and 3 (current); Member/officer of numerous Commissions for 5 intern. societies; Chair, co-Chair or member of 25 EU Panels; 45 Symposia/Short Courses organized; 28 Doctoral students supervised.

CV Task Force co-Leader
Dr. Joachim H. Gottsmann

School of Earth Sciences, University of Bristol, Wills Memorial Building, Queen's Road, Bristol, BS8 1RJ, United Kingdom

Date of birth: 04/04/1969

Qualifications:

2003 Professional Certificate in Business Management, Open University Business School, United Kingdom

2001 Ph.D. (Dr. rer. nat); Faculty of Geosciences; Ludwig-Maximilians-University, Munich, Germany; Advisor: Prof. D. B. Dingwell

1996 Diploma Degree 'Geology and Palaeontology'; Friedrich-Alexander University, Erlangen; Germany;

Professional appointments over last 10 years

08/12- Reader in Research, School of Earth Sciences, University of Bristol, UK

10/10-07/12 Lecturer then Senior Lecturer, School of Earth Sciences, University of Bristol, UK

10/08-02/09 Visiting chair in Mineralogy, Petrology and Geochemistry, Department of Earth and Environmental Sciences, Ludwig-Maximilians-University, Munich, Germany.

10/05-11/13 Royal Society University Research Fellow, Department of Earth Sciences, University of Bristol, UK

Selected Recent Research Funding

1. NERC: RiftVolc Large grant (2014-19); Award: £3.7M; Lead-PI: Whaler, Edinburgh; Bristol PI: Biggs, Co-Is: Kendall, Cashman, Blundy, Whitaker and Gottsmann

2. EC FP7-ENV: MEDSUV Consortium - Mediterranean Supersite Volcanoes; 2013-2016; Award: 6M Euro; Coordinator: Puglisi (INGV-Catania), PI Bristol: Gottsmann (140k Euro);

3. NERC and ESSRC: Strengthening Resilience in Volcanic Areas (STREVA) project Award: £3.7M; Lead-PI: Barclay, UEA Bristol PI: Phillips, Co-Is: Sparks, Watson, Biggs, Hogg, Gottsmann

4. EC FP7 Initial Training Network 2012-16: NEMOH Numerical, experimental and stochastic modelling of volcanic processes and hazard (€4.1M; Coordinator: Papale, INGV, Pisa; PI Bristol: Rust; Co-I Bristol: Gottsmann

5. EC FP7-ENV: VUELCO Consortium - Volcanic Unrest in Europe and Latin America: Phenomenology, eruption precursors, hazard forecast, and risk mitigation; 2011-2015; Award: €3.5M Euro Scientific Coordinator: Gottsmann;

6. NERC NE/G016593/1 Standard Grant (2009-2013), Award: £652k (fEC); PI: Gottsmann, Co-Is: Sparks, Rust, Blundy, Dohmen

7. NERCNE/E0077961/1SmallGrant(2007-9)InvestigatingcyclicchangesinthepotentialfieldatSoufriere Hills volcano, Montserrat, Award: £24.5k fEC; PI: Gottsmann

Selected honours, editorial and other selected roles

• IAVCEI Wager medal 2008

• Editor-in-Chief of 'Physics and Chemistry of the Earth' (Elsevier; 2009-)

• Editorial board member of 'Journal of Volcanology and Geothermal Research' (Elsevier; 2007-)

• Editor of: 'Collapse calderas: Analysis, Modelling and Response', Developments in Volcanology 10, Elsevier, Amsterdam, Hardbound, 519 pp., publication date: MAY-2008 ISBN-13: 978-0-444-53165-0

• Scientific Officer for Volcanic Hazards of the European Geoscience Union (EGU) section on Natural Hazards (2007-11) and Chair of NH Volcanic Hazards subprogram (2007-11)

• Leader of IAVCEI commission on Collapse Calderas (2005-2009); co-Chair : IAVCEI Commission on Volcanic Hazards and Risk (2014-)

• UK Steering group member and UK national delegate for volcano observations of EPOS project (2010-) and Volcanology Advisory Panel member for INSU (France; 2010-)

Publications: h-factor: 20, 70+ peer-reviewed journal papers