CRL School 2025

Corinth Rift Observatory

Patras-Nafpaktos, Greece

19-23 September 2025

Welcome!!!

Dear teachers and students, welcome to the 2025 edition of the CRL-School!

As you know, the general objective of the School is to unite Master and PhD students from various Greek and foreign universities collaborating in the Corinth Rift Observatory (http://crlab.eu), together with high school European teachers to introduce them to different geophysical and geological methods and observations and first-hand scientific knowledge.

At the School, methods such as seismology, GPS, SAR interferometry, the methods underlying the ESA-SENTINEL mission, the Geohazards Exploitation Platform (GEP) and paleomagnetism, will be examined from a theoretical point of view as well as from the point of view of their applications and results in the specific areas of the Corinth Rift. This rift is one of the most seismically active regions of Europe, where movements are so rapid that it has been defined as "a natural geodynamical laboratory". The knowledge acquired there is applicable to other seismically active regions worldwide and, thus, has a general signification.

As every year, this school will comprise a mixture of topical presentations, excursions in the field and hand-on activities. It will take place partly in Nafpaktos, partly in Patras. We foresee that the participants will gain understanding of all these methods and their results and be engaged in discussions about the interpretation of the results and how they can be used in teaching and learning in general Earth Sciences, Chemistry, Physics, Biology and Geology.

In Nafpaktos, the presentations will be given in the Municipality Building, which has been generously proposed to us by the Mayor and the Council of the city of Nafpaktos. In Patras we will be hosts of several departments of the University.

Highlights will be, among others, the educational activities for High School, the dissemination to the general public, the presentation of the seismobox, the hand-on ESA software, the field training sessions and the presentation of cores from the sea bottom. There will be also a presentation of the structural monitoring and geometric control of the Rio-Antirrio bridge.

The Organizing/Scientific Committee has been one of the key elements in preparing this School, but other people and/or Institutions have contributed to it. We would like to continue to offer students and teachers the opportunity to the CRL School in future years. Of course, this depends upon us being able to show our sponsors that the School has been useful to students and teachers in their studies and in their daily teaching, or as inspiration for teaching geoscience in new ways in their schools.

Therefore, after the School we will ask you:

- To complete the evaluation forms (for students and for teachers) as soon as possible and email it back to us,

- To make a presentation of your experiences at the CRL School to a group of your colleagues after your return from Nafpaktos, and

- Teachers, we invite you to send us reports and photographs about how you have used the CRL School information in your classrooms. We also encourage you to write reports on the School in publications specifically intended for geosciences, science and geography teachers.

Important Note!!!

The interaction among the lecturers and the students of the School is considered crucial. It is being performed throughout the full duration of the School and will be dependent not only from the type of the presentation/hand-on but also from the students' availability, their preparedness and their proactiveness with the corresponding lecturer/chairperson and the Organizing/Scientific Committee. We encourage the students, and it is foreseen as their duty to initiate communication.

For now, please enjoy your CRL School 2025 in Nafpaktos-Patras! And please tell your colleagues at school, fellow students and friends about it and encourage them to come to future editions of the School!

The CRL School Organizing/Scientific Committee

Acknowledgments

CRL School 2025 Organizing/Scientific Committee

CHAIR

Panagiotis Elias
Assistant Professor,
University of Patras,
Patras, Greece
pelias@upatras.gr

MEMBER

George Kaviris
Professor,
National and Kapodistrian University of Athens
Athens, Grecce
gkaviris@geol.uoa.gr

MEMBER

Fotios Danaskos
Secondary Education teacher of Geology,
EGU GEFO for Hellas/8th Junior High School in Chalandri Hellas, Athens, Greece
fdanas@yahoo.gr

MEMBER

Kiki Makri
PhD Geologist,
Postdoctoral Researcher/National Observatory of Athens,
Teacher at 3rd Experimental Junior High School of Agia Varvara, Athens, Greece
kikimakri@noa.gr

MEMBER

Olympia Tripolitsiotou
MSc Geologist,
Geology Teacher at Evangeliki Scholi Smyrnis Model Junior High School
Athens, Greece
olytrip20@gmail.com

MEMBER

Angelos Zymvragakis
MSc Geologist, PhD student
National and Kapodistrian University of Athens
Athens, Greece
azymvragakis@geol.uoa.gr

MEMBER

Christofer Kaltsas
BSc Geologist, MSc Student
Aarhus University
Aarhus, Denmark
christoferkaltsas@gmail.com

MEMBER

Alexandros Papadopoulos
BSc Geologist, MSc Student
National and Kapodistrian University of Athens
Athens, Greece
alpa@geol.uoa.gr

MEMBER

George Goutsos
BSc Student, MSc Student
National and Kapodistrian University of Athens/National Observatory of Athens
Athens, Greece
goutsos2002@yahoo.com

MEMBER

Andreas Karakonstantis
PhD, Researcher,
National and Kapodistrian University of Athens
Athens, Greece
akarakon@geol.uoa.gr

Panagiotis Elias

George Kaviris

Fotios Danaskos

Kiki Makri

Angelos Zymvragakis

Christofer Kaltsas

Alexandros Papadopoulos

George Goutsos

Olympia Tripolitsiotou

Andreas Karakonstantis

Corinth Rift Laboratory School–2025
(Patras-Nafpaktos September 19-23, 2025)

Programme

Friday September 19, 2025

Department of Physics, University of Patras

13:00 – 13:30	**Welcome to the CRL School 2024**
13:30 – 14:00	**Why CRL?** Pascal Bernard, Institut de Physique du Globe de Paris - IPGP / CNRS, Paris, France
14:00 – 14:30	**Geodynamic setting, large earthquakes and the growth of faults in the western Corinth rift** Ioannis Koukouvelas, University of Patras, Greece
14:30 – 15:00	**The geodetic monitoring of the Corinth Rift Observatory with GPS and SAR interferometry** Panagiotis Elias, University of Patras, Greece

15:00 – 15:30 Break

15:30 – 16:00	**Seismic Parameters and Microseismicity in the Gulf of Corinth** Eleftheria Papadimitriou, Aristotle University of Thessaloniki, Greece Vasileios Karakostas, Aristotle University of Thessaloniki, Greece
16:00 – 16:30	**Large Earthquakes and Focal Mechanisms in the Gulf of Corinth** George Kaviris, National and Kapodistrian University of Athens, Greece
16:30 – 17:00	**Off-shore faults imaging and monitoring in the Corinth Rift** Maria Geraga, University of Patras, Greece.
17:00 – 17:30	**From Research to Market: Turning Ideas into Community Impact** Spiros Mazarakis, Ecosystem designer | Co-Founder & Managing Director at Pleiades IoT Innovation Cluster, Greece.
17:30 - 18:00	**EGU Education Committee: Empowering Geoscience Education** Stavros Stathopoulos, Chair of EGU Education Committee

18:00 Departure for Nafpaktos (Akti Hotel)

Saturday September 20, 2025

08:30 Departure from Akti Hotel

Nafpaktia Conference room, Nafpaktos

08:45 – 09:00	**Welcome messages**
09:00 – 09:30	**Tectonics, structural setting and tectono-sedimentary processes in the Corinth Rift** Haralambos Kranis, National and Kapodistrian University of Athens, Greece
09:30- 10:00	**Use of CRL Data for Detailed Seismological Studies** Anna Serpetsidaki, University of Patras, Greece
10:00 – 10:30	**Historical elements for sciences and observatories** Fiori-Anastasia Metallinou, National Observatory of Athens, Greece
10:30 – 10:40	**Introduction to geological (outcrop) field trip of Sunday** Haralambos Kranis, National and Kapodistrian University of Athens, Greece

10:40 – 11:10 Break

11:10 – 13:00	**Hands on GNSS measuring** Panagiotis Elias, University of Patras, Greece

13:00 – 15:00 Lunch Break

15:10 – 15:30 Transport to hands-on lab

15:30 – 16:30	**Hands on simple seismic software package provided in the CRL portal** George Kaviris, National and Kapodistrian University of Athens, Angelos Zymvragakis, National and Kapodistrian University of Athens, Greece
16:30 – 17:30	**Presentations by the students** 3mn per student + questions

17:30 – 20:45 Free time

20:45 – 21:45 before)	**Sky gazing (in an area close the hotel Akti that will be announced shortly**

Fiori-Anastasia Metallinou, National Observatory of Athens, Greece
Drivas argyris, 3rd Junior High School of Nafpaktos, Astronomy Group of Nafpaktos, Greece

Sunday September 21, 2025

08:30 Departure from Akti Hotel

08:30 – 13:30   **Field trip at Psaromita (GNSS and seismic station), geologic stops along the journey.**
Haralambos Kranis, National and Kapodistrian University of Athens, Greece

Arrival at Akti hotel

13:30 – 15:00 Lunch Break

15:00 – 15:30   **A concise overview of lithostratigraphy architecture and its implications to the Quaternary evolution of the Gulf of Corinth (Greece).**
Koutsovitis Petros, University of Patras

15:30 – 16:00   **Sustainable Development in the Classroom: The MET Museum Kits on Water as an Educational Tool**.
Peny-Theologi Gouti and Maria Kostourou, Science and Technology Museum, University of Patras, Greece.

16:10 – 16:40 Break

16:40 – 17:10   **Live data education: the real time experience and the earthquake suitcase**
Vasliki Kouskouna, Nikos Sakellariou, National and Kapodistrian University of Athens, Greece

17:10 – 17:40   **Discovering the dynamics of Corinth Gulf**
Bakopoulou Athanasia, Assimina Antonarakou, National and Kapodistrian University of Athens, Greece

17:40 – 18:10   **Best practices for Geosciences teaching in Mediterranean area**
Eleni Koutsopoulou, PhD Geologist, Teacher at Secondary Education/ Patras.

Monday September 22, 2025

10:00 Departure from Akti Hotel to 3rd Junior High School in Nafpaktos

10:30 – 11:30	**Hand on Educational Activities based on ESA Education - Teaching using open data, case study: active fault bases** Makri Kiki, 3rd Experimental Junior High School of Agia Varvara/National Observatory of Athens
11:30 – 12:30	**Hand on activities based on ELIs / Teaching Earthquakes in classroom using STEM** Danaskos Fotios. EGU GEFO for Hellas/8th Junior High School in Chalandri Hellas

12:30 - 14:30 Lunch Break

14:50 – 16:50	**Follow-up Hands on GNSS measuring** Pierre Briole, École normale supérieure / CNRS, Paris, France Panagiotis Elias, National Observatory of Athens, Greece

University Students

Nafpaktia Conference room, Nafpaktos

09:00 – 09:30	**Application of GNSS to seismotectonic studies** Vasilios Sakkas, National and Kapodistrian University of Athens, Greece
09:30 – 10:00	**Introduction to satellite SAR interferometry** Panagiotis Elias, University of Athens, Greece
10:00 – 10:30	**Multitemporal monitoring of active faults with close-range (t-LiDAR, UAS) remote sensing equipment** Emmanouel Vassilakis, National and Kapodistrian University of Athens, Greece

10:30 – 11:30 Break

11:30 – 12:00	**Seismic hazard in Greece with a focus in the Western Gulf of Corinth** Angelos Zymvragakis, National and Kapodistrian University of Athens, Greece
12:00 – 12:30	**Physical mechanisms behind seismic site response - Some examples from Aegion** Olga Ktenidou, National Observatory of Athens, Greece

12:30 – 14:30 Lunch Break

14:30 – 14:50 Transport to hands-on lab

14:50 – 16:50	**Follow-up Hands on GNSS measuring** Pierre Briole, École normale supérieure / CNRS, Paris, France Panagiotis Elias, National Observatory of Athens, Greece

08:30 Departure from Akti Hotel

Laboratory of Seismology, University of Patras

09:30 – 10:00	**Applications of Machine Learning in Seismology**
	Vasilis Kapetanidis, National and Kapodistrian University of Athens, Greece

10:00 – 10:30	**Relative Sea level changes in the Corinth Gulf during the late Holocene**
	Niki Evelpidou, National and Kapodistrian University of Athens, Greece
	Anna Karkani, National and Kapodistrian University of Athens, Greece

10:30 – 11:00	**Earthquake structural response of Rion Antirrion Bridge: 15yrs of continuous structural surveillance through permanent instrumentation system**
	Akis Panagis, GEFYRA S.A., Greece

11:00 – 11:30 *Move from Seismology Laboratory to Department of Geology*

11:30 – 12:00	**Recent sedimentary processes in the Gulf of Corinth. Seismic and aseismic turbidites**
	Spyros Sergiou, University of Patras, Greece

12:00 – 12:50	**(parallel groups of ~10) Laboratory class for coring study**
	Spyros Sergiou, University of Patras, Greece
	(parallel groups of ~10) Laboratory class: Study of archaeomaterials in "KERAMos Lab"
	Ioannis Iliopoulos, University of Patras, Greece
	Vaia Xanthopoulou, University of Patras, Greece

12:50 – 14:00 Lunch at the cafeteria near the department of Physics

14:00 – 15:00 *Drive to the Helike Fault*

15:00 – 16:30	**Educational field activities at the Helike fault/hand on ELIs at the field.**
	CRL School's educational team: Kiki Makri (Makri Kiki, 3rd Experimental Junior High School of Agia Varvara/National Observatory of Athens) & Fotis Danaskos (Danaskos Fotios. EGU GEFO for Hellas/8th Junior High School in Chalandri Hellas)

16:30 – 17:30	**Field trip to the Helike fault**
	Emmanouel Vassilakis, National and Kapodistrian University of Athens, Greece

End of the CRL School 2025 - School Bus to the city of Aigion and to Nafpaktos

See the timetable for buses from Aigio to Athens

Participants

Students

a/a	First Name	Last Name	e-mail
1	Şükran	Acar	sukranacaar@gmail.com
2	Antonis	Anagnostou	anagnostou241@gmail.com
3	Trifon	Boutas	mpoutastryphonas@gmail.com
4	Jamie	Chow	jnychow@gmail.com
5	Georgia	Geramani	geoger2000@gmail.com
6	George	Goutsos	goutsos2002@yahoo.com
7	Bahar	Güvem	bahar.guvem@bogazici.edu.tr
8	Martin	Hronek	martin.hronek493@student.cuni.cz
9	Candan	Kafalı	candan26ck@gmail.com
10	Doğanaz	Karakaş	doganaz.karakas@std.bogazici.edu.tr
11	Dimitris	Lampridis	jimisla2005@gmail.com
12	Alexandru Catalin	Macovei	alexandrumacovei04@gmail.com
13	Teresa	Martínez	ter.martinezperez@gmail.com
14	Ali	Masihi	masihia@natur.cuni.cz
15	Nikoleta	Mataftsi	nikoletamataftsi@gmail.com
16	Evdokia	Papadopoulou	evdokiapap97@gmail.com
17	Eleni	Pegioudi	pegiou@hotmail.com
18	Ivana	Štencová	ivca.st@volny.cz
19	Eleftherios	Trantos	mre00154@uowm.gr
20	Muhammed	Turgut	muhammed.turgut@yildiz.edu.tr

Teachers

a/a	First Name	Last Name	e-mail
1	Alexandru	Codreanu	codreanu.alexandru@infp.ro
2	Alexandra	Gkotsi	alexgotsi@yahoo.gr
3	Aysel	Gökce	ayselolgun07@gmail.com
4	Maria	Kakava	kakavasm@gmail.com
5	Christina	Karousatou	christina.karou@gmail.com
6	Nektarios	Kazanis	nkazanis@sch.gr
7	Adão	Mendes	adaoeva@yahoo.com
8	Ina	Rrapaj	ina.rrapaj16@gmail.com
9	Nikolaos	Saltampasis	saltampas@gmail.com
10	Elsa	Salzedas	elsa.salzedas@gmail.com
11	Glikeria	Skeva	glikeriaskeva@gmail.com

Curricula Vitae

Pascal Bernard

Seismologist

Senior scientist at Institut de Physique du Globe de Paris (IPGP) Université Paris Cité, France

bernard@ipgp.fr

Education and Career

1978: Ecole Normale Supérieure (ENS) de Saint-Cloud, Physics

1979: Master's Degree in Physics, University Paris 6

1980: "DEA" (Advanced Studies Diploma) in Internal Geophysics, University Paris 6

1981: "Agrégation" in Physics

1983: "Thèse de 3ème cycle" (PhD Thesis), University Paris 6, Seismology

1985: « Aide-Physicien CNAP » (Assistant Professor) at IPGP (Institut de Physique du Globe de Paris)

1987: "Doctorat d'Etat" (State Doctorate) in Seismology, University Paris 6

1987-2015: "Physicien Adjoint CNAP" (Associate Professor) at IPGP

2015-present: " Physicien CNAAP" (Professor) at IPGP

Research interests

1. Dynamics of the seismic cycle

2. Observation, analysis, and modeling of mechanical couplings between various seismic events and physical processes within fault and volcanic systems.

3. Fault slip, fluid pressure diffusion, swarms of small earthquakes and seismic precursors.

4. High-frequency seismic radiation from faults during rupture.

5. Slow and transient deformation instabilities within the Earth's crust.

6. Development of innovative optical instrumentation for enhanced observation of fast and slow deformation transients.

Publications and services

- more than 106 papers in rank A, peer-review journals

see https://www.ipgp.fr/~bernard/publications-bernard-1985-2023.pdf

- Citation index > 3500, IH > 32

Pierre Briole

Research Director
Ecole Normale Supérieure,
Paris Sciences et Lettres Research University,
Département des Géosciences

briole@ens.fr

Education
1990   Ecole Normale Supérieure de Cachan in applied physics. Agrégation 1983.PhD, University Paris VI, Paris

Career
2007-today	Research Director CNRS
	Ecole Normale Supérieure/Paris Sciences et Lettres Research University - Département des Géosciences - Laboratoire de Géologie
2008-2009	09/2008-2009: Directeur des études,
2010-2013	2010-2013: Head of the Department
2004-2007	Research Director CNRS
	Institut de Physique du Globe de Paris
2005-2006	Director of the laboratory of Geodesy
1990-2004	Chargé de Recherche CNRS
	Institut de Physique du Globe de Paris - Département de Sismologie
1989-1990	Researcher
	Institut Géographique National – Laboratoired'Opto-Electronique et de Micro-informatique

Research interests
Study of the deformation or volcanoes (Etna, Campi Flegrei, Vulcano (Italy), Piton de la Fournaise (France), Nisyros (Greece), Sakurajima (Japan) and seismic zones (Asal Rift (Djibouti), Gulf of Corinth (Greece), Northern Chile, Umbria (Italy), Algeria, Bulgaria) using various methods, including GPS, radar interferometry, high resolution imaging and local methods (tiltmeter, micro-gravity, ...).
Modelling of ground deformations and interpretation combining tectonic, geodetic, and seismological data.
Development of new technologies (Projects of satellites, ground based radars, robots).

Publications and services
73 articles in journals with peer review, 2951 citations
194 communications in international meetings
3 articles in outreach journals, participation to 4 educational &/or educative movies, several interviews in French radios, several lectures in schools

Coordinator of the "Insegnaci Etna" project http://ietna.eu

Eleftheria Papadimitriou

Professor of Seismology
Aristotle University of Thessaloniki
School of Geology
Geophysics Department

ritsa@geo.auth.gr

Education

1981   B. Sc. In Geology – University of Thessaloniki, Greece
1984   Ph. D. Thesis in Seismology – University of Thessaloniki, Greece

Career

1985-1990   Research Assistant of the Geophysics Department of the Aristotle University of Thessaloniki
1985–1990   Lecturer
1990–1994   Assistant Professor
1994–2001   Associate Professor

Research interests

Long–term earthquake prediction on the basis of seismicity and probabilistic models
Studies of seismic sequences
Seismotectonics
Fault plane solutions and stress patterns
Source parameters by synthetic seismograms
Time dependent seismicity by the application of the Time Predictable Model.
Fractal analysis of the global seismicity and the seismicity of Greece
Stress evolution by the use of Coulomb Failure Function changes
Statistical Seismology
Seismic hazard assessment

Publications and services

Karakostas, V., Mirek, K., Mesimeri, M., Papadimitriou, E. & Mirek, J. The aftershock sequence of the 2008 Achaia, Greece, earthquake: joint analysis of seismicity relocation and persistent scaterrers interferometry. Pure & Applied Geophysics, 174, 151–176, DOI 10.1007/s00024–016–1368–y, 2017.

Mangira, O., Console, R., Papadimitriou, E. & Vasiliadis, G. A restricted Linked Stress Release Model (LSRM) for the Corinth gulf (Greece). Tectonophysics, 723, 162–171, 2018.

Bountzis, P., Papadimitriou, E. & Tsaklidis, G. Estimating the earthquake occurrence rates in Corinth Gulf (Greece) through Markovian arrival process modeling. Journal of Applied Statistics, 46(6), 995–1020, doi:10.1080/02664763.2018.1531977, 2019.

Vassilis Karakostas

Professor of Seismology
Aristotle University of Thessaloniki
School of Geology
Geophysics Department

vkarak@geo.auth.gr

Education
1981 B. Sc. In Geology – University of Thessaloniki, Greece
1988 Ph. D. Thesis in Seismology – University of Thessaloniki, Greece

Career
1988–1991 Cooperating Researcher of the Geophysics Department of the Aristotle University of Thessaloniki
1991–1999 Seismologist of the Central Seismological Station of Thessaloniki of the same Department
1999–2003 Lecturer of Seismology
2003–2009 Assistant Professor of Seismology
2009–2014 Associate Professor of Seismology

Research interests
Long–term earthquake prediction on the basis of seismicity and probabilistic models.
Studies of seismic sequences
Seismotectonics
Fault plane solutions and stress patterns
Tsunamis and tsunami hazard
Fractal analysis of the global seismicity and the seismicity of Greece
Stress evolution by the use of Coulomb Failure Function changes
Statistical Seismology
Seismic Hazard Assessment
Induced Seismicity

Publications and services
Karakostas, V., Mirek, K., Mesimeri, M., Papadimitriou, E. & Mirek, J. The aftershock sequence of the 2008 Achaia, Greece, earthquake: joint analysis of seismicity relocation and persistent scaterrers interferometry. Pure & Applied Geophysics, 174, 151–176, DOI 10.1007/s00024–016–1368–y, 2017.

Mesimeri, M., Karakostas, V., Papadimitriou, E., Tsaklidis, G. & Jacobs, K., (2018). Relocation of recent seismicity and seismotectonic properties in the Gulf of Corinth (Greece), Geophys. J. Int., 212, 1123-1142. doi: 10.1093/gji/ggx450.

Mesimeri, M. & Karakostas, V. Repeating earthquakes in western Corinth Gulf (Greece): implications for aseismic slip near locked faults. Geophys. J. Int., 215, 659-676. doi: 10.1093/gji/ggx301, 2018.

George Kaviris

Professor
National and Kapodistrian University of Athens
Faculty of Geology and Geoenvironment
Department of Geophysics and Geothermics

gkaviris@geol.uoa.gr

Education

1994:   Graduated from the Faculty of Physics, National and Kapodistrian University of Athens (NKUA)
2003:   PhD of Seismology, Department of Geophysics and Geothermics, Faculty of Geology and Geoenvironment, NKUA. Thesis subject: "Study of Seismic Source Properties of the Eastern Gulf of Corinth".

Career

2024 – current: Professor of "Seismology–Seismic Anisotropy", Sect. Geophysics and Geothermics, Department of Geology and Geoenvironment, NKUA.
2021 – 2024:   Associate Professor of "Seismology–Seismic Anisotropy", Sect. Geophysics and Geothermics, Department of Geology and Geoenvironment, NKUA.
2016 – 2021:   Assistant Professor of "Seismology – Seismic Anisotropy", Sect. Geophysics and Geothermics, Department of Geology and Geoenvironment, NKUA.
2013 – 2016:   Lecturer of "Seismology", Sect. Geophysics and Geothermics, Department of Geology and Geoenvironment, NKUA.
2006 – 2013:   Research Associate, Laboratory of Seismology, Sect. Geophysics and Geothermics, Department of Geology and Geoenvironment, NKUA.
2004 – 2007:   Post-Doc Researcher, Research Project "Pythagoras" entitled: «Identification of Anisotropic Media in Greece using body and surface waves».

Research interests

My primary research interest is Seismic Anisotropy and Shear-wave Splitting of the upper crust and mantle. In addition, Seismotectonics, Seismic Hazard and Risk, Receiver Functions, Ambient Noise, Slip Distribution, Seismic Swarms and Earthquake Early Warning.

Publications and services

Supervisor of 20 MSc and 24 BSc students. I am currently supervising 2 PhD Theses.

I have 191 publications in international scientific journals and congress proceedings. Among my publications for the Gulf of Corinth:

G. KAVIRIS, A. Zymvragakis, P. Bonatis, V. Kapetanidis, N. Voulgaris, 2022. Probabilistic and Scenario – based Seismic Hazard Assessment on the Western Gulf of Corinth (Central Greece). Appl. Sci., 12 (21), 11152. doi: 10.3390/app122111152.

G. KAVIRIS, P. Elias, V. Kapetanidis, A. Serpetsidaki, A. Karakonstantis, V. Plicka, L. De Barros, E. Sokos, I. Kassaras, V. Sakkas, I. Spingos, S. Lambotte, C. Duverger, O. Lengliné, Ch. Evangelidis, I. Fountoulakis, O.-J. Ktenidou, F. Gallovič, S. Bufféral, E. Klein, El M. Aissaoui, O. Scotti, H. Lyon-Caen, A. Rigo, P. Papadimitriou, N. Voulgaris, J. Zahradnik, A. Deschamps, P. Briole, P. Bernard, 2021. *The Seismic Record*,1, doi.org/10.1785/0320210021.

Awards and honors

January 2017: Highly cited Research Award for "Karst collapse susceptibility mapping considering peak ground acceleration in a rapidly growing urban area" (co-author). This publication was awarded as being among the five (5) most cited works of the "Engineering Geology" for the period January 2014 - June 2016

Maria Geraga

Professor,

Laboratory of Marine Geology and Physical Oceanography, Department of Geology, University of Patras, 26504 Rio Achaia

mgeraga@upatras.gr

Education

2000:	Phd in Oceanography, Department of Geology, University of Patras, Greece. Title of thesis: 'Evaluation of palaeoceanographic and palaeoclimatic changes during Holocene in SW Aegean Sea (Greece) and the formation of the sapropels''
1993:	B. Sc. in Geology, University of Patras, Greece

Career

2020-today	Professor, Dept. of Geology, University of Patras, Greece
2016-2020	Assistant Professor (permanent), Dept. of Geology, University of Patras, Greece
2012-2015	Assistant Professor (adjustment), Dept. of Geology, University of Patras, Greece.
2006-2012	Lecturer in "Archaeological Oceanography", Dept. of Geology, University of Patras, Greece
2000-2006	Under Appointed Ass. Professor in Polytechnics, in Chemical Oceanography. Higher Educational Technological Institute of Messolonghi, Greece.
1993-2006	Research Associate in the Laboratory of Marine Geology and Physical Oceanography, Dept. of Geology, University of Patras.

Research Interests

Palaeoclimatology-Palaeoceanography, Marine sedimentology, Marine Geoarchaeology, Marine hazards, Marine natural and cultural heritage sites and Marine Pollution

Publications And Services

She has more than 85 articles in journals of Science Citation Index, peer reviewed scientific journals and chapters in scientific books and 65 publications (full length papers) and more than 55 publications (abstracts) in International Conferences in the field of Marine Science. Scientist in charge for several national and EU projects. Reviewer in journals of Science Citation Index and peer reviewed journals. Evaluator in national and international Science Foundations. Supervisor of undergraduate and postgraduate dissertations and Phd dissertations. Member of the Science Party of IODP Expedition 381 Corinth Rift

Spiros Mazarakis
Intrapreneurship Consultant,

Unisystems, Luxembourg

mazarakis@pleiadesiot.com

Education

2004-2010:	Electrical & Computer Engineering Diploma, University of Patras, School of Engineering
2014-2016:	Msc in Business Administration MBA, Universty of Patras, Department of Business Administration
2018-present	Postgraduate Diploma in Innovation and Design Thinking, Global Ivy Emeritus Institute of Management, Singapore Collaboration with MIT Sloan, Columbia Business School Executive Education & Tuck School of Business at Dartmouth

Career

2010-2013	Digital Marketing Specialist Freelancer Marketing Consultant in Social Media, Branding and Digital campaigns.
2014-2019	Product Manager SaMMYacht.com
	Advanced technologies transform a regular Marina into a Smart Marinas.
	Startup financed from European Commission (Smart cities - Fiware).
2019-2020	Business Designer Unisystems, Athens
	IT services in the Public, Financial, Telecommunications and Private sector.
2020-present	Counsellor of the National Sectoral Council for Research, Technology and Innovation Ministry of Development & Investments
	Advisory body for the formulation and implementation of the national policy for Research, Technology and Innovation.
2020-present	Co-Founder PleiadesIOT.com Innovation Cluster
	Greek IoT ecosystem of large companies, successful SMEs, dynamic startups, research centers, universities, associations and end-user representatives.
2021-present	Corporate Intrapreneurship Consultant
	Unisystems, Luxembourg
	Business expertise on a globalized level, deep knowledge of local needs, innovative solutions & products at the forefront of technology, strategic alliances with domestic players, partnership with major international vendors.

Honors and Awards

Speaker at Fiware tech summit, Malaga, Spain, 28/11/2017
The future of smart solutions and the concept of "Next Generation" Marina

Fully-funded Scholarship 2014 (Third Place Award)
Innovation & Entrepreneurship Competition by Hellenic Associations of Young Entrepreneurs.

Stavros Stathopoulos

EGU Education Committee Chair

Researcher
Department of Environmental Engineering
Democritus University of Thrace

education@egu.eu / sstathop@env.duth.gr

Education

2021	PhD, Department of Environmental Engineering, DUTH
2013	MSc, Department of Environmental Engineering, DUTH
2011	BSc, Department of Environmental Engineering, DUTH

Career

2025 - today	EGU Education Committee Chair
2023-today	Post-doc researcher [Department of Forestry and Management of the Environment and Natural Resources, DUTH]
2021- today	Post-doc researcher [Department of Environmental Engineering, DUTH]
2021-2025	Appointed Lecturer [Department of Environmental Engineering, DUTH]

Publications and services (selected)

- Kourtidis K., **Stathopoulos S.** and Amiridis V. (2025). On the impact of thunder on cloud ice crystals and droplets, Atmos. Chem. Phys., 25, 5935–5946. https://doi.org/10.5194/acp-25-5935-2025
- Andrade C., **Stathopoulos S.**, Mourato S., Yamasaki E. N., Paschalidou A., Bernardo H., et al. (2025). The role of interventions in enhancing indoor environmental quality in higher education institutions for student well-being and academic performance. Current Opinion in Environmental Science & Health, 100611. https://doi.org/10.1016/j.coesh.2025.100611
- Koimtzidis M., Falalakis G., **Stathopoulos S.**, Kopsidas O., Kourtidis K. and Gemitzi A. (2025). Assessing development patterns and carrying capacity using nighttime light analysis: A case study in Greece. Remote Sensing Applications: Society and Environment, 37, 101462. https://doi.org/10.1016/j.rsase.2025.101462
- **Stathopoulos S.**, Gemitzi A. and Kourtidis K. (2024). Statistical Downscaling of Remote Sensing Precipitation Estimates Using MODIS Cloud Properties Data over Northeastern Greece. Remote Sens. Earth Syst. Sci.:1-10. https://doi.org/10.1007/s41976-024-00107-1
- Kofidou M., **Stathopoulos S.** and Gemitzi A. (2023). Review on spatial downscaling of satellite derived precipitation estimates. Environ. Earth Sci. 82, 424. https://doi.org/10.1007/s12665-023-11115-7
- Misios S., Kasoar M., Kasoar E., Gray L., Haigh J., **Stathopoulos S.**, Kourtidis K., Myhre G., Olivié D., Shindell D., Tang T. (2021). Similar patterns of tropical precipitation and circulation changes under solar and greenhouse gas forcing. Environ. Res. Lett. 16, 104045. https://doi.org/10.1088/1748-9326/ac28b1
- **Stathopoulos S.**, Tsonis A.A. and Kourtidis K. (2021). On the cause-and-effect relations between aerosols, water vapor and clouds over East Asia. Theor. Appl. Climatol. 144(1), 711-722. https://doi.org/10.1007/s00704-021-03563-7

Haralambos Kranis

Assistant Professor
National and Kapodistrian University of Athens
Department of Geology and Geoenvironment

hkranis@geol.uoa.gr

Education

Degree in Geology National and Kapodistrian University of Athens, Post-graduate Diploma, in Seismology, (International Institute for Seismology and Earthquake Engineering), Ph.D. in Geological Sciences, National and Kapodistrian University of Athens

Career

My scientific career mainly involves working for the Department of Geology and Geoenvironment, at the Sector of Dynamic, Tectonic and Applied Geology, while I have also served as Tectonics and Structural Geology expert for the General Secretariat for Civil Protection, collaborated with the Earthquake Research and Planning Organization (EPPO), and the Hellenic Centre for Marine Research (HCMR); and as a consultant for major infrastructure projects, such as gas and oil pipelines, and management of natural hazards.

Research Interests

My main research interests include, but are not limited to, Tectonics and Structural Geology (especially brittle deformation), Neotectonics, Active Tectonics and Earthquake Geology, Tectonic Geomorphology and Palaeoseismology. In the last decade, I am involved in research on the tectonic control on sedimentation and basin formation in actively evolving continental rifts and their inactive analogues. Extending my scope in field geology and geological mapping, I have adopted methods and techniques that involve spatial analysis of geological structures through Structure from Motion (SfM), 3D outcrop modelling of outcrops, digital field mapping and modelling of tectonically-controlled landscapes.

Publications and Services

I have published over 40 articles in peer-reviewed scientific journals, several field guides and special reports, as well as geological and neotectonic maps at various scales.

Awards and Honors

Scholarship from the Government of Japan (Japan International Cooperation Agency)
Goldschmidt Lecturer, Geological Survey of Norway.

Anna Serpetsidaki

Researcher

Seismological Laboratory, Geological Department,
University of Patras, Patras, Greece

annaserp@upatras.gr

Education

BSc Geology (1999), Geological Department, University of Patras, Greece
PhD Seismology (2004), Applied Geology and Geophysics, Geological Department, University of Patras, Greece
Postdoctoral Research (2005), Faculty of Mathematics and Physics, Department of Geophysics, Charles University of Prague, Czech Republic.

Career

2013 – today: Faculty Member of Geology Department, Patras University
2000 – 2013: Researcher, Seismological Laboratory of Patras University

Research Interests

Ground Response Analysis, Seismic Hazard, Seismic Source Properties, Moment Tensor,Microsesmic networks, Seismotectonics.

Publications And Services

Nikolakopoulos, K.G., Kyriou, A., Sokos, E., Bousias, S., Strepelias, E., Groumpos, P., Mpelogianni, V., Roumelioti, Z., **Serpetsidaki, A.,**Paliatsas, D., Stephanopoulos, P., Ganas, A., Charalampoulou, V.B., Athanasopoulos, T..(2023). Outcomes of continuous monitoring of crucial infrastructure in the framework of "ΠΡΟΙΟΝ" project. Conference Paper. Proceedings of SPIE - The International Society for Optical Engineering.

Serpetsidaki, A.,Kapetanidis, V., Elias, P., Rigo, A., Spingos, I., De Barros, L., Lengliné, O., Bufféral, S., Karakonstantis, A., Bernard, P., Briole, P., Zahradník, J., Kaviris, G., Plicka, V., Sokos, E., Voulgaris, N.. (2023). The 2020–2021 seismic sequence in the Western Gulf of Corinth: Insights on the triggering mechanisms through high resolution seismological and geodetic data analysis. Journal Article. Tectonophysics.

Zahradnik J., Aissaoui E.M., Bernard P., Briole P., Bufferal S., De Barros L., Deschamps A., Elias P., Evangelidis C.P., Fountoulakis I., Gallovic F., Kapetanidis V., Kaviris G., Ktenidou O.-J., Lambotte S., Lengline O., Lyon-Caen H., Noble M., Plicka V., Rigo A., Roumelioti Z., **Serpetsidaki A**., Sokos E., Voulgaris N. (2022). An Atypical Shallow Mw 5.3, 2021 Earthquake in the Western Corinth Rift (Greece). Journal of Geophysical Research: Solid Earth, 127 (9), art. no. e2022JB024221 DOI: 10.1029/2022JB024221.

Ganas, A.; Hamiel, Y.; **Serpetsidaki, A**.; Briole, P.; Valkaniotis, S.; Fassoulas, C.; Piatibratova, O.; Kranis, H.; Tsironi, V.; Karamitros, I.; Elias, P.; Vassilakis, E. The Arkalochori Mw = 5.9 Earthquake of 27 September 2021 Inside the Heraklion Basin: A Shallow, Blind Rupture Event Highlighting the Orthogonal Extension of Central Crete. Geosciences 2022, 12, 220. https://doi.org/10.3390/geosciences12060220

V. Plicka, F. Gallovic, J. Zahradnik, **A. Serpetsidaki**, E. Sokos, N. Vavlas, A. Kiratzi, The 2020 Samos Mw7 earthquake: Source model depicting complexity and rupture directivity, Tectonophysics, Volume 843, 2022, 229591, ISSN 0040-1951, https://doi.org/10.1016/j.tecto.2022.229591.

Serpetsidaki, A., Sokos, E., Tselentis, G.-A. A ten year Moment Tensor database for Western Greece (2016) Physics and Chemistry of the Earth, 95, pp.2-9.

Serpetsidaki , A., Elias, P., Ilieva, M., Bernard, P., Briole, P., Deschamps, A., Lambotte, S., Lyon-Caen, H., Tselentis, G-A. &Sokos, E. (2014), New Constraints from Seismology and Geodesy on the Mw=6.4 2008 Movri (Greece) Earthquake. Evidence for a Growing Strike Slip Fault System. Geophysical Journal Intenational, , 198 (3), pp. 1373-1386.

Fiori - Anastasia Metallinou

Public Outreach Officer
National Observatory of Athens
Institute for Astronomy, Astrophysics, Space
Applications and Remote Sensing (IAASARS)

ametal@noa.gr

Education

2009	Ph.D. in Space Physics, Aristotle University of Thessaloniki, National Observatory of Athens. Title of Thesis: "Development and Recovery of Magnetic Storms in Geospace".
2001	M.Sc. Degree in Atmospheric and Environmental Physics, Aristotle University of Thessaloniki, Greece.
1998	Diploma in Physics, Physics Department, Aristotle University of Thessaloniki, Greece.
2008	Diploma in Classical Singing from the Athens Conservatory "Musical Horizons".
2004-2006	Studies in the Faculty of Melodramatic State Conservatory, Thessaloniki, Greece.

Career

2014-today	Lead Public Outreach Officer at the Thissio Visitor Center of the National Observatory of Athens (located at the historic site in the center of Athens).
2010-2013	Research Associate at the Institute for Astronomy, Astrophysics, Space Applications and Remote Sensing of the National Observatory of Athens.

Research interests

Simulation of ion acceleration in the Earth's magnetosphere during magnetic storms and magnetospheric substorms.
Sonification of scientific data describing magnetospheric disturbances.
The use of the "sounds of space" in education, dissemination of Astronomy and the arts.

Publications and services

F.-A Metallinou, "Pythagoras Redivivus: The Music of the Spheres and it' s Reification in Modern Astronomy" 10th Congress of the International Society for the Interdisciplinary Study of Symmetry, Adelaide, Australia, 1-6 December 2016.

E. Rovithis, F.-A Metallinou, A. Floros, "Hearing a magnetic storm: an Educational Interactive Audio Environment", 8th Pan Hellenic Conference of Acoustics 2016, 3-4 October 2016, Athens.

2019: Scientific research, scenario and presentation of the documentary "*The Experiment of Eratosthenes*", production: Cosmote TV.
2018: Scientific research, scenario and voice over of the documentary "*Time of Greece*", production: Cosmote TV.

Awards and honors

She has received the Research Grant "HRAKLEITOS" with priority in Basic Research of the Ministry of Education of Greece (2002 - 2005) and the award of the "Barbanis Price of Astronomy" from the Aristotle University of Thessaloniki (1995).

She has been a TEDx speaker in 2014, 2018 and 2022. She contributes to the dissemination of Astronomy and Space Physics concepts with public lectures and articles in the media, newspapers, public journals, TV shows, documentaries and activities combining science and art. She has been an invited speaker by educational organizations, private and public schools, laboratory science centers of the Hellenic Department of Education, associations of amateur astronomers,

Panagiotis Elias

Assistant Professor

University of Patras

pelias@upatras.gr

Education

2013 PhD in the framework of co-tutelle agreement between the École Normale Supérieure (Département des Géosciences, France) and the University of Patras (Department of Physics, Greece), with title "Ground deformation observed in the western Corinth rift (Greece) by means of SAR interferometry".

2007 MSc in Signal Processing for Telecommunications and Multimedia of the department of Informatics and Telecommunications of the University of Athens, Greece.

2003 Degree of Electronics Engineering of the Technological Educational Institute of Piraeus.

Career

2024-current Assistant Professor in University of Patras
2021-2024 Associate Researcher of IAASARS/NOA.
2005-2021 Scientific staff of IAASARS/NOA.
1998-2005 Research assistant of Institute for Space Applications and Remote Sensing (later IAASARS) of NOA.

Research interests

I have participated in more than 40 research projects in the field of satellite geodesy and image/signal processing exploiting the synergy of active and passive earth observations satellites as well as GNSS and other in-situ measurements such as inclinometers, levelling and seismological data. My research interest is focused in the detection and measurement of ground deformation and infrastructure instability due to geophysical processes of manmade activities. Moreover, I am contributing to the development of methodologies and to the modelling of the deformation sources considering the particular underlying geodynamic and geophysical background. I am author of 45 peer refereed publications in international journals, and more than 75 presentations in international conferences.

Selected publications and services

1. Serpetsidaki, A., Kapetanidis, V., Elias, P., Rigo, A., Spingos, I., De Barros, L., ... & Voulgaris, N. (2023). The 2020–2021 seismic sequence in the Western Gulf of Corinth: Insights on the triggering mechanisms through high resolution seismological and geodetic data analysis. Tectonophysics, 863, 230011.

2. P. Elias, I Spingos, G Kaviris, A Karavias, T Gatsios, V Sakkas and I . Parcharidis (2021). Combined Geodetic and Seismological Study of the December 2020 Mw= 4.6 Thiva (Central Greece) Shallow Earthquake. Applied Sciences 11 (13), 5947

3. Briole P., Ganas A., Elias P., Dimitrov D. (2021). The GPS velocity field of the Aegean. New observations, contribution of the earthquakes, crustal blocks model, Geophysical Journal International, 2021, ggab089, https://doi.org/10.1093/gji/ggab089

4. Roukounakis N., Elias P., Briole P., Katsanos D., Kioutsioukis I., Argiriou A., Retalis A. (2021). Tropospheric Correction of Sentinel-1 Synthetic Aperture Radar Interferograms Using a High-Resolution Weather Model Validated by GNSS Measurements.Remote Sensing 13 (12), 2258

5. Briole P., Ganas A., Elias P., Dimitrov D. (2021). The GPS velocity field of the Aegean. New observations, contribution of the earthquakes, crustal blocks model, Geophysical Journal International, 2021, ggab089, https://doi.org/10.1093/gji/ggab089

Co-responsible for the operation of 16 GNSS stations of the CRL observatory

Awards and honors

Member of the ESA Living Planet Symposium Scientific Committee for the years 2010 and 2013

Angelos Zymvragakis

MSc Geologist
National and Kapodistrian University of Athens
Faculty of Geology and Geoenvironment
Department of Geophysics and Geothermics

azymvragakis@geol.uoa.gr

Education

2021	BSc degree in Geology and Geoenvironment, National and Kapodistrian University of Athens (NKUA).
2023	MSc degree in Applied Geology and Geophysics, Earth Science and Environment, National and Kapodistrian University of Athens (NKUA).
2023-today	PhD candidate in seismic hazard, National and Kapodistrian University of Athens (NKUA).

Career

2021-2022	Participated in research project titled "Evaluation of Seismic, Conflagration & Flood In Attica Region", in the Deliverable titled "Seismicity, seismic hazard and strong motion distribution maps of Attica region (Argosaronikos' islands, Kithira and Antikithira)".

Research interests

My primary research interest is Probabilistic Seismic Hazard Assessment (PSHA) and Physics-based seismic hazard assessment.

Publications and services

Pavlou, K., Kaviris, G., Kouskouna, V., Sakkas, G., Zymvragakis, A., Sakkas, V., Drakatos, G., 2021. Minor seismic hazard changes in the broader area of Pournari artificial lake after the first filling (W. Greece). Results in Geophysical Sciences 100025. https://doi.org/10.1016/j.ringps.2021.100025

Kaviris, G., Zymvragakis, A., Bonatis, P., Sakkas, G., Kouskouna, V., Voulgaris, N., 2022. Probabilistic Seismic Hazard Assessment for the Broader Messinia (SW Greece) Region. Pure and Applied Geophysics. https://doi.org/10.1007/s00024-022-02950-z

Kaviris, G., Zymvragakis, A., Bonatis, P., Kapetanidis, V., Voulgaris, N., 2022. Probabilistic and Scenario-Based Seismic Hazard Assessment on the Western Gulf of Corinth (Central Greece). Applied Sciences 12. https://doi.org/10.3390/app122111152

Kaviris, G., Zymvragakis, A., Bonatis, P., Kapetanidis, V., Spingos, I., Mavroulis, S., Kotsi, E., Lekkas, E., Voulgaris, N., 2023. A Logic-Tree Approach for Probabilistic Seismic Hazard Assessment in the Administrative Region of Attica (Greece). Applied Sciences 13. https://doi.org/10.3390/app13137553B

Awards and honors

2021: First degree grade in the undergraduate programm of the Department of Geology and Geoenvironment of the National and Kapodistrian University of Athens.

2022: Award for the third best oral presentation by a young scientist at the 3rd European Conference on Earthquake Engineering and Seismology (3ECEES) held in Bucharest, Romania from September 4-9, 2022. The publication was entitled "A Preliminary Probabilistic Seismic Hazard Assessment for Boeotia, Central Greece".

2022: Scholarship under the programme "Awards of Excellence to Higher Education Graduates" for the academic year 2020-2021.

2022: Reciprocal scholarship with the obligation to provide auxiliary teaching work in the respective first cycle curricula. The title of the scholarship is "Support of the educational activities of the National and Kapodistrian University of Athens (NKUA) during the academic year 2021-2022 with the integration of supplementary teaching in addition to the main lectures".

Petros Koutsovitis

Assistant Professor, pkoutsovitis@upatras.gr

University of Patras, Department of Geology

Education

Dr. Petros Koutsovitis specializes on the fields of Geology, Petrology, Mineralogy, Geochemistry and CCS applications, having conducted post-doctoral research in Greece and Austria (NKUA, UNIVIE and HSGME). During 2016-2019 he collaborated with CERTH, actively participating in Horizon2020 and RFCS funded project's. As of 2019, he is Assist. Prof. (University of Patras, Department of Geology). Dr Petros Koutsovitis has been awarded by the Academy of Athens for his research.

Research Interests

- Magmatic Rocks
- Petrogenesis of Ophiolites
- Metasomatic processes
- Sustainable use of raw materials

Publications

- Koutsovitis, P., Magganas, A., Ntaflos, T., Koukouzas, N., Rassios, A.E., Soukis, K., 2020. Petrogenetic constraints on the origin and formation of the Hellenic Triassic rift-related lavas. Lithos 368-369, 105604.
- Tzevelekou, T.; Lampropoulou, P.; Giannakopoulou, P.P.; Rogkala, A.; Koutsovitis, P.; Koukouzas, N.; Petrounias, P. Valorization of Slags Produced by Smelting of Metallurgical Dusts and Lateritic Ore Fines in Manufacturing of Slag Cements. Appl. Sci. 2020, 10, 4670.
- Arvanitis, A.; Koutsovitis, P.; Koukouzas, N.; Tyrologou, P.; Karapanos, D.; Karkalis, C.; Pomonis, P. Potential Sites for Underground Energy and CO_2 Storage in Greece: A Geological and Petrological Approach. Energies 2020, 13, 2707.
- Badouna, I.; Koutsovitis, P.; Karkalis, C.; Laskaridis, K.; Koukouzas, N.; Tyrologou, P.; Patronis, M.; Papatrechas, C.; Petrounias, P. Petrological and Geochemical Properties of Greek Carbonate Stones, Associated with Their Physico-Mechanical and Aesthetic Characteristics. Minerals 2020, 10, 507.
- Petrounias, P. Giannakopoulou, P., Rogkala, A., Kalpogiannaki, M., Koutsovitis, P., Damoulianou, M.E., Koukouzas, N., 2020. Petrographic Characteristics of Sandstones as a Basis to Evaluate Their Suitability in Construction and Energy Storage Applications. A Case Study from Klepa Nafpaktias (Central Western Greece). Energies, 13(5), 1119.
- Petrounias, P.; Rogkala, A.; Giannakopoulou, P.P.; Lampropoulou, P.; Koutsovitis, P.; Koukouzas, N.; Laskaris, N.; Pomonis, P.; Hatzipanagiotou, K. Removal of Cu (II) from Industrial Wastewater Using Mechanically Activated Serpentinite. Energies 2020, 13, 2228.
- Koukouzas, N., Koutsovitis, P., Tyrologou, P., Karkalis, C., Arvanitis, A., 2019. Potential for Mineral Carbonation of CO_2 in Pleistocene Basaltic Rocks in Volos Region (Central Greece). Minerals, 9 (10), 627.
- Koutsovitis, P., Magganas, A., Ntaflos, T., Koukouzas N. 2018. Rodingitization and carbonation, associated with serpentinization of Triassic ultramafic cumulates and lavas in Othris, Greece. Lithos 320-321, 35-48.
- Liard, F., Pomonis, P. Koutsovitis. P., Gait, J., Stamatakis, M. 2017. Ophiolites associated with pottery production in Bronze Age Crete. Archaeometry.

Ioannis Iliopoulos

Professor
Department of Geology, |
University of Patras (UP), Greece

ilios@upatras.gr

Education
Dr Ioannis Iliopoulos is a Professor at the Department of Geology, University of Patras, Greece. He conducted his PhD Thesis in the field of Metamorphic Petrology.

Career

2019 – today	Director of the Science & Technology Museum, School of Natural Sciences, UP
2022 – today	Professor, Department of Geology, UP
2008 – 2022	Associate Professor / Assistant Professor / Lecturer, Department of Geology, UP
2003 – 2008	Laboratory Assistant (ETEP), Department of Geology, UP
1998 – 2001	Researcher, Dipartimento di Chimica e Fisica della Terra, University of Palermo, Palermo, Italy

Research interests
His research focuses on the systematic application of analytical techniques for the study of archaeomaterias and earth raw materials from the wider Mediterranean area (Italy, Spain, Greece) and Latin America (Ecuador, Peru) and he leads the KERAMos Research Group. He has published in peer reviewed international journals and edited volumes (h-index: 14).

Publications and services
He is an external collaborator of the Institut d'Arqueologia de la Universitat de Barcelona (IAUB) Spain and a scientific consultant of the Academy of Institutions and Cultures, Greece. Since 2019 he has been elected as the Director of the Science and Technology Museum at the University of Patras and has supervised several thematic exhibitions and educational programs for students of primary, secondary and higher education under a participatory framework.

Awards and honors
He was awarded the Picker Interdisciplinary Science Institute research award (Colgate University, USA) and was appointed as Researcher at the Dipartimento di Chimica e Fisica della Terra (CFTA), University of Palermo, Italy, under the auspices of the interdisciplinary European Geo-archaeological Research Project "GEOPRO".

Vasiliki Kouskouna

Professor
National and Kapodistrian University of Athens
Department of Geology and Geoenvironment
Section of Geophysics and Geothermics

vkouskouna@geol.uoa.gr

Education
Degree in Physics, PhD in Seismology, National and Kapodistrian University of Athens

Career
2021-today	Professor, NKUA
2007-2021	Associate Professor, NKUA
1999-2007	Assistant Professor, NKUA
2017	Fulbright Visiting Scholar, Saint Cloud State University (SCSU), MN, USA
2009-2012	Director of Laboratory of Seismology, DGG, NKUA
2008-todate	Volunteer lecturer, «Popular Open University», Athens, Greece

Research interests
Seismicity, Seismic Hazard, Seismic Risk, Natural Hazards, Macroseismology, Historical Earthquakes, Disaster Response, Engineering Seismology, Educational Seismology

Publications and services
V. Kouskouna, N. Petropoulos, T. Tsounakos (2005). "Living with earthquakes – protecting myself". Patakis Editions, 38pp. (in Greek)

A. Kourou, M. Panoutsopoulou, O. Vaggelatou, I. Bergiannaki, N. Petropoulos, I. Parcharidis, V. Kouskouna, 2005. "Earthquakes and society – Education, Protection, Recovery". Patakis Editions, 40pp. (in Greek)

Kouskouna V, Diagourtas D, Galanos N, Makropoulos K (2006). Earthquake scenarios for educational shake table. ECEES: 1st Eur. Conf. on Earthq. Eng. and Seismology 3-8/9, Geneva, ID-2022, p.472.

Kouskouna V, Sakkas G (2013). The University of Athens Hellenic Macroseismic Database (HMDB.UoA): historical earthquakes. J Seismol, 17(4), 1253-1280, https://doi.org/10.1007/s10950-013-9390-3.

Kouskouna V, Kaperdas V, Sakellariou N (2020). Comparing calibration coefficients constrained from early to recent macroseismic and instrumental earthquake data in Greece and applied to eighteenth century earthquakes. J Seismol,

Kassaras I, Kapetanidis V, Ganas A, Tzanis A, Kosma C, Karakonstantis A, Valkaniotis S, Chailas S, Kouskouna V, Papadimitriou P (2020). The New Seismotectonic Atlas of Greece (v1.0) and Its Implementation. Geosciences, 10(11):447, https://doi.org/10.3390/geosciences10110447.

Kouskouna V, Sakkas G, Cecic I, Tsimpidaros VI, Sakkas S, Kaviris G, Tertulliani A (2020). Earthquake induced crises: game tree approached risk communication and lessons learnt. Annals of Geophysics, 64/3,

Kouskouna V (2020). The earthquake suitcase. 360°Actions, Corporate Social Responsibility Panorama, Hellenic Petroleum Group, p.8.

Kouskouna V, Ganas A, Kleanthi, M Kassaras I, Sakellariou, N Sakkas G, Valkaniotis S, Manousou E, Bozionelos G, Tsironi V, Karamitros I, Tavoularis N, Papaioannou Ch, Bossu R (2021). Evaluation of macroseismic intensity, strong ground motion pattern and fault model of the 19 July 2019 Mw5.1 earthquake west of Athens. J Seismol, https://doi.org/10.1007/s10950-021-09990-3.

Kouskouna V, Ridge H, Young D, Olafson E, Gazouli M (2021). Building Partnerships for Building Resiliency in Traumatised Youth. we4DRR (women exchange for Disaster Risk Reduction) virtual Gen. Ass. 16/6. Poster

Kouskouna V, Dakis M, Ridge H, Young D, Gazouli M, Olafson E (2021). Teaching Social-Emotional learning through an earthquake lesson. 37th ESC2021 virtual, 19-24/9.

Awards and honors
Fulbright Scholar Award (2017)

Nikos Sakellariou

PhD Geologist
National and Kapodistrian University of Athens
Department of Geology and Geoenvironment
Section of Geophysics and Geothermics

nsakel@geol.uoa.gr

Education
Degree in Physics, PhD in Seismology, National and Kapodistrian University of Athens

Research interests
Nikos Sakellariou is a Geologist, master's and PhD holder of the National and Kapodistrian University of Athens, specializing in Seismology. He has significant research and educational experience, participating in the university courses and practical exercises, several research programs, public training on earthquake protection issues, conferences and field trips. From 2004 to 2006 he participated in the research program "SEISMOPOLIS - Pilot System for the Public's Familiarization and Information on Earthquake and Earthquake Protection Issues", educating, training and familiarizing the public with the earthquake phenomenon and effects. In November 2006, as member of the research team in the research exchange program between Greece and Slovenia, he worked in Ljubljana searching archival material and recorded sources of historical earthquakes of Greece. In 2007, he participated in the program "Patrimoine Culturel, Vulnérabilité et Prévention contre les Risques (P.C.V.P.R)", in Ravello, Italy. He was also researcher in the "Greco-Risks, Hellenic Natural Hazards Risk Management System of Systems" research program (2014-2015), dealing with risk assessement, due to earthquakes and landslides, working on the vulnerability of the building stock of Greece and produced the relevant maps using ArcGis software. From 2020 to 2021, he participated in the research program "Integrated Early Warning & Seismic Risk Management System with application to Industrial Infrastructures", with main duties the installation of a seismographic and accelerometric network in the Gulf of Corinth, and the processing of ground motion data. During April-September 2021, he joined the "HELPOS - Hellenic Lithosphere Observation System" research program, analysing the vulnerability of buildings and critical infrastructure, also participating in field work activities. From 2021 to 2023, he was full time researcher in the projects "ACTIPROL (NSRF2014-2020)-ACTions CIvil PROtection Lixouri", "INFRASEPREL (NSRF2014-2020)-INFRAStructure Earthquake PREvention Lixouri" and "KNETSEISRL (NSRF2014-2020)-Knowledge NETworks SEISmic Risks Lixouri", studying archival material for historical earthquakes of Kefalonia, determining the vulnerability of the building stock of the Paliki peninsula, and conducting ambient noise measurements, in order to construct the subsurface structure of Paliki area. From November 2023 to February 2025, he was invited as visiting researcher at the Museum of Natural Sciences, in Madrid, Spain, within the framework of the research program "Seismic hazard scenarios for urban areas and infrastructure in coastal regions of the southern Iberian Peninsula and the Paliki Peninsula (Cephalonia, Greece), processing ambient noise measurements conducted in Kefalonia, to determine the thickness of its geological formations and their geotechnical properties. He has experience in macroseismic field surveys as a member of the University of Athens field missions taking place after major earthquakes (e.g. Andravida 2008, Kefalonia, 2015, Athens 2019). He has actively participated in several conferences with presentations of papers of seismological and geotechnical interest (e.g. ESC-ECEES 2024, 2022, 2021, 2014, 2008), and he was a member of the organizing committee of the "8th International Colloquium on Historical Earthquakes, Palaeo-Macroseismology and Seismotectonics", in Lixouri, Kefalonia, in September 2023. He co-authored several publications in peer review journals. He is skilled user of specialized seismological software (Grilla, Geopsy, Seisgram), as well as Microsoft Office, Surfer, GMT, ArcGis and QGIS.

Athanasia Bakopoulou
Laboratory and Teaching Staff, Geoscience Education
Laboratory of Geoscience Teaching and Learning,
Department of Geology and Geoenvironment,
National and Kapodistrian University of Athens, Greece
abakopoulou@geol.uoa.gr

Education

PhD in Geoscience Education "Systemic approach of geodynamic phenomena in secondary education" National and Kapodistrian University of Athens (NKUA)

Career

2021-   Laboratory and Teaching Staff, Laboratory of Geoscience Teaching and Learning, NKUA

2004 -2021   Science Teacher at Junior High School

2005-2007   Administration Division, Ministry of Education

1999-2004:   Research Assistant, Department of Geology and Geoenvironment, NKUA

Research interests

Teaching and Learning Earth Science, Students' and teachers' concepts and system thinking level on geodynamic phenomena, climate change and water. Development of Earth system thinking skills and Earth system teaching techniques.

Natural hazard and disaster risk reduction (DRR) education. Development of educational DRR activities and techniques. Development of sustainable DRR skills. Students' and adults' awareness level on natural hazards and disaster risk reduction (DRR).

Publications and Services

My scientific work includes nineteen scientific publications, participation in numerous research projects, conferences (as a speaker) and collaborations in Greece and abroad, organization of workshops, mainly focusing on Teaching and Learning Geoscience.

▪ **Bakopoulou A.,** Dousiaki C., Diakakis M., Andreadakis E., Mavroulis S., Gogou M., Kranis, H., Antonarakou A., Lekkas E. (**2025**). Teachers' experience, attitudes and skills on flood events: The case of Daniel storm 2023, Thessaly, Greece. Proc. 17th Int. Congr. Geol. Soc. Greece, 28-31 May 2025, Lesvos, Greece, Bul. Geol. Soc. Greece.
▪ M. Diakakis, S. Mavroulis, C. Filis, Y. Bantekas, M. Gogou, K.-N. Katsetsiadou, M. Mavrouli, V. Giannopoulos, A. Sarantopoulou, P. Nastos, E. Vassilakis, A. Konsolaki, E. Kotsi, S. Moraitis, E. Stamati, A. **Bakopoulou**, E. Skourtsos, P. Carydis, E. Lekkas (**2024**). The diverse impacts of extreme storms in the European South. The case of Storm Daniel (2023) in Greece. EGU General Assembly 2024 [Internet]. 2024:EGU24-14898.
▪ **BAKOPOULOU** A., ANTONARAKOU A., LEKKAS E., VOUZATOU A., KAKONIKOU C., KOUTSOPOULOU P. (2023). Primary school teachers' and students' alternative ideas on climate change. 2nd Congress of National and Kapodistrian University of Athens on Climate Crisis, NKUA, 2023.
▪ **BAKOPOULOU**, A, KATSETSIADOU, N.- A. KYRIAZIS, E., ALEXOUDI, V., GRAMBAS, A., KOTSI, E., STAMATI, E., ANTONARAKOU, A., LEKKAS, E., 2022. Disaster and crisis management awareness level of local authorities in the District of Attica Municipalities before and after training courses. Proc., 16th Int. Conf. Geol. Soc. Greece, GSG2022, Ext. Abs. GSG2022-283.
▪ **BAKOPOULOU**, A., ANTONARAKOU, A. AND ZAMBETAKIS-LEKKAS, A., 2021. Existing and Emerging Students' Alternative Ideas on Geodynamic Phenomena: Development, Controlling Factors, Characteristics. Educ. Sci., 11, 646. https:// doi.org/10.3390/educsci11100646.
▪ **BAKOPOULOU** A., ANTONARAKOU A., LOZIOS S., ZAMBETAKIS –LEKKAS, A., 2016. Development and precodification of a lithosphere questionnaire as a tool in education research (Geoscienses). Bulletin of the Geological Society of Greece, 50(1), 201-208.
▪ **BAKOPOULOU** A., ANTONARAKOU A., LOZIOS S. AND ZAMBETAKIS - LEKKAS A., 2015. Holistic approach of the curriculum of Greek junior high school on lithosphere and the implementation of the GeoCause – PaP – CoRe baseline approach on geoscience curriculum development. Bulletin of the Geological Society of Greece, vol. XLIL, p. 29-37.

Assimina Antonarakou
Department of Geology and Geoenvironment,
National and Kapodistrian University of Athens, Greece
aantonar@geol.uoa.gr

Dr. Asimina Antonarakou is a Professor at the Department of Geology and Geoenvironment, School of Science, National and Kapodistrian University of Athens, specializing in Micropaleontology, Marine Geology and Geoscience Education. She has served two terms as Vice Chair of the Department and currently holds the position of Chair, as well as being a regular member of the University Senate. Furthermore, she is the Director of the Laboratory of Geoscience Education within the Department, a member of the Board of the University's Research and Development Company, coordinator of the Interdisciplinary Committee for Risk and Crisis Management, and member of the Council of the NKUA Lifelong Learning Center (KEDIVIM).

She directs the MSc program 'Strategies of Environmental, Disaster and Crisis Management' and is a member of the coordinating committees of the international postgraduate programs 'Geographic Information Systems' and 'Industrial and Environmental Applications in Micropaleontology'. She also serves on the Curriculum Committee of the inter-institutional MSc 'Paleontology-Geobiology', which involves departments from NKUA, Aristotle University of Thessaloniki, University of Patras, and the University of the Aegean.

She teaches in several undergraduate courses and is responsible for the core course 'Teaching Geological and Environmental Geosciences'. At the postgraduate level, she teaches courses such as 'Environmental Education' and 'Geoscience Education'. She is also the Scientific Director for twelve and Academic Supervisor for nine distance learning programs under NKUA's Lifelong Learning Center, covering topics such as geosciences education, disaster and crisis management, GIS, and environmental education.

Dr. Antonarakou has served as the secondary education liaison in the education committee of Greek geoscience organizations, is Vice President of the Hellenic Geological Society, a board member of the Committee on Science Education, and a full member of the Standing Scientific Committee on Social Earthquake Defense of the Earthquake Planning and Protection Organization (OASP).

She has participated in 23 research projects, is the Principal Investigator of the project 'PalaeoScope' under the 'Research – Create – Innovate' program, focusing on developing innovative tools to highlight the geological and historical heritage of touristic regions, and the Academic Lead of the 'Kidedu' project, which develops interactive 3D educational games in geology, geoenvironment, and mathematics using virtual reality technologies for primary school students.

She has supervised and participated as a committee member in numerous undergraduate, MSc, and PhD theses. She has given over 100 presentations at scientific conferences, workshops, and professional events in her field. She has authored or edited six books (three in Greek and three in English) and published over 300 scientific papers in peer-reviewed Greek and international journals, conference proceedings, and presentations.

Fotios Danaskos

Geologist, School Teacher
8th Junior High School in Chalandri, HELLAS

fdanas@yahoo.gr

Education

2008: National and Kapodistrian University of Athens Hellas, School of Education/University College London Institute of Education, M.A. Education and Human Rights direction Special Education, MSc.

2004: National and Kapodistrian University of Athens Hellas, Department of Communication & Media Studies, Annual Teacher Training Seminar, "Professional Identity and Communication Counseling".

1994: Technological Educational Institute of Athens Hellas, Faculty of Health and Caring Professions, Physiotherapy Department, BSc.

1986: National and Kapodistrian University of Athens Hellas, Department of Geology, Athens, BSc.

Career

1997-2007	Freelance Physiotherapist
1994-2013	Physiotherapist School Teacher
2013-today	Geologist School Teacher

Research interests

Researcher «Recording the symptoms of pain in the joints of the spine and upper and lower limbs of students in Vocational Secondary School, 2005.

Member of the research group "Pattern of Child Status in Primary and Vocational Secondary School, 2005

Publications and services

E.G.U. Geoscience Education Field Officer for Greece

Member of the Scientific Committee of C.R.L. School, Corinth Rift Observatory

G. Secretary of the Committee of GEO sciences Didactis of Geological Society of Greece

Participation in CRL 2018 – 2021 and Insegnaci Etna School 2019, Assistant presenter in CRL 2019 on the SEISMOBOX

Member of the B' Training Team in the New Curricula for Geology/Geography in High School 2022-2023

Erasmus+ , eTwinning School Coordinator

Organization of programs on Environmental Education and Geosciences through partnerships with schools of Europe.

Member of the Writing Team for the course "Introduction to Physiotherapy", of the of the Assistant Physiotherapists 2nd class of the TVES of Health and Welfare Sector, Pedagogical Institute 2001.

Member of the Jury Team for the Workshop on "Supervised Practice in Welfare Services" Round 1, Class 2 TVES, of Health and Welfare Sector, Pedagogical Institute 2001.

Member of the Curriculum Development Team of the Assistant Physiotherapists of the TVES. 2000.

Kiki Makri

Teacher of Geosciences - Postdoctoral Researcher - Institute of Environmental Research and Sustainable Development of National Observatory of Athens

kikimakri@noa.gr

Education

2015: PhD, Department of Geology, Aristotle University of Thessaloniki. Prof. Spyridon Pavlides. Study of historical development of geological education in Greece, (Greece). ND36236

2007: M.Sc., Teaching of Chemistry and New Educational Technologies, Department of Chemistry, Aristotle University of Thessaloniki

2005: B.Sc., Department of Geology, Aristotle University of Thessaloniki (Greece).

Career

2020 - today: Teacher of Geosciences at Secondary Education Ministry of Education and Religious Affairs.

2020 - today: Postdoctoral Researcher: Institute of Environmental Research and Sustainable Development of National Observatory of Athens.

2021 - 2021: Curriculum Designer of course Geology and Geography for Junior High School. Institute of Education Policy/Ministry of Education and Religious Affairs.

2021: Curriculum Designer of Skill Labs "Climate change - Natural disasters - Civil protection" for High School. Institute of Education Policy/Ministry of Education and Religious Affairs.

2019 - 2020: Educator at the school program "Sustainable Planet", Stavros Niarchos Foundation Cultural Center, Athens.

2017 – 2020: Assistant Coordinator MSc in Space Sciences Technologies and Applications at National Observatory of Athens.

2016 – 2018: Contract Lecturer: Teaching for the course "Teaching of Geology". Department of Geology, Aristotle University of Thessaloniki, Greece.

Research interests

History of Geosciences, History of Education, Epistemology, Teaching Methodology, Curriculum Design, Curriculum Studies.

Publication and services

Kyriaki Makri, The Content of Meteorology in Greek Geosciences' Textbooks. World Journal of Educational Research ISSN 2375-9771 (Print) ISSN 2333-5998 (Online) Vol. 9, No. 5, 2022, http://dx.doi.org/10.22158/wjer.v9n5p43

Makri, K. and Danaskos, F., The history of Geosciences, as teaching scenario, EGU General Assembly 2023, Vienna, Austria, 24–28 Apr 2023, EGU23-9044, https://doi.org/10.5194/egusphere-egu23-9044, 2023.

Danaskos, F., Makri, K., Kaviris, G., and Elias, P. The CRL School in the European Education community and the modern classroom, EGU General Assembly 2023, Vienna, Austria, 24–28 Apr 2023, EGU23-4424, https://doi.org/10.5194/egusphere-egu23-4424, 2023.

Awards and Honors

Operational Programme «Human Resources Development, Education and Lifelong Learning» in the context of the project "Reinforcement of Postdoctoral Researchers - 2nd Cycle" (MIS-5033021), implemented by the State Scholarships Foundation (IKY). Co-financed by Greece and the European Union (European Social Fund- ESF). Research title: "Approaches of Meteorology and Climate Change in school textbooks of sciences: the case of at Junior High School and High School in Greece".

EC2E2N Award for excellence present: 2012 Makri K., Antoniadis A., Koliarmou E. National Greek Team. The Magic of Chemistry - European Competition of educational chemical experiments. Annual Plenary meeting Milan

Athanassios Ganas

Research Director

Institute of Geodynamics, National Observatory of Athens

aganas@noa.gr

Education

Bachelor of Science, Geology, University of Athens; Master of Science in Structural Geology, Carleton University, Canada; PhD in Geological Remote Sensing and Earth Sciences University of Reading, UK.

Career

2012-2023   Research Director NOA
2000-2011   Researcher NOA

Research interests

Active Tectonics-Seismotectonics and Remote Sensing / Geophysical Earth Observation including Fault Interaction, Tectonic Geomorphology and GNSS networks.

Publications and services

Evelpidou N, Ganas A, Karkani A, Spyrou E, Saitis G. 2023. Late Quaternary Relative Sea-Level Changes and Vertical GNSS Motions in the Gulf of Corinth: The Asymmetric Localization of Deformation Inside an Active Half-Graben. Geosciences, 13(11):329. https://doi.org/10.3390/geosciences13110329

Mesimeri, M., Ganas, A., Pankow, K.L., 2022. Multisegment ruptures and Vp/Vs variations during the 2020-2021 seismic crisis in western Corinth Gulf, Greece, Geophysical Journal International, Volume 230, Issue 1, Pages 334–348, ggac081, https://doi.org/10.1093/gji/ggac081

In October 2021 he was elected President of the Geological Society of Greece. He is the Editor-in-Chief of BGSG https://ejournals.epublishing.ekt.gr/index.php/geosociety.Since 2017 he serves as Member of the Greek National Committee for Seismotectonics. During 2010-2017 he served as regular member at the Board of Directors of the EPPO (Earthquake Planning and Protection Organisation, Greece). Since 2021 he has been an elected member of the EPOS TCS-GNSS Consortium Board. Since 2013 he has initiated and leads the NOAFAULTs project (Database of Active Faults of Greece; https://zenodo.org/record/8075517).

Awards and honors

In 2016 he received the best Geodesy paper of the Academy of Athens (with Kostas Chousianitis). In 2007 he won the Fulbright prize "Project Title: *Earthquake recurrence and seismic hazard forecast along the Cascadian and Hellenic subduction zones*". In 2010 he was awarded the distinction «AGU Editors' Citations for Excellence in Refereeing». In 2017 he was announced as "Outstanding Reviewer" for Tectonophysics.ed faults. Geophys. J. Int., 215, 659-676. doi: 10.1093/gji/ggx301, 2018.

Vassilis Sakkas

Laboratory Teaching Personnel
National and Kapodistrian University of Athens
Department of Geology and Geoenvironment
Section of Geophysics and Geothermics

vsakkas@geol.uoa.gr

Education

1999   Ph.D. in Geophysics - University of Leicester, UK.
              Research project: "Combined Transient Electromagnetic and Magnetotelluric study   across southern Kenya Rift Valley"
1994   BSc in Physics - National and Kapodistrian University of Athens

Career

2000-2015   Research Associate in Space Application Research Unit in Geosciences, Department
              of Geophysics &Geothermics,
2015-today   Laboratory Teaching Personnel, Department of Geophysics and Geothermics, NKUA

Research interests

Exploration geophysicist with twenty fiveyears experience in field operations and R&D with emphasis on processing and interpretation of multiple geophysical (Electromagnetic, magnetic, gravity, seismic) data to investigate earth's interior.

Great experience in collecting, processing and interpretation of geodetic data (GNSS) and joint interpretation and modelling of GNSS and interferometric data for ground deformation monitoring due to tectonic, seismic, volcanic or manmade (water/oil extraction) reasons. Person in charge of the permanent GNSS stations of NKUA. Expert in processing of GNSS data using Bernese v5.2 software.

Publications and services

Tzanis, A., Chailas, S., Sakkas, V., Lagios, E., 2020. "Tectonic deformation in the Santorini volcanic complex (Greece) as inferred by joint analysis of gravity, magnetotelluric and DGPS observations" *Geophys. J. Int.* 220, 461–489. doi: 10.1093/gji/ggz461

Sakkas, V., Lagios, E. 2017 "Ground deformation effects from the ~M6 earthquakes (2014–2015) on Cephalonia– Ithaca Islands (Western Greece) deduced by GPS observations" Acta Geophysica,65,1,207-222, Springer International Publishing, DOI: 10.1007/s11600-017-0017-x).

Sakkas, V., Lagios, E., 2015 "Fault modelling of the early-2014 ~M6 Earthquakes in Cephalonia Island (W. Greece) based on GPS measurements" Tectonophysics,644,184-196, Elsevier. DOI 10.1016/j.tecto.2015.01.010.

Awards and honors

2017 "Academy of Athens" Reward "Dimitrios Lampadarios" for research publication on geodesy for the paper:
«Fault modelling of the early-2014 ~M6 Earthquakes in Cephalonia Island (W. Greece) based on GPS measurements» [Tectonophysics, Vol. 644-645 (2015) pp. 184-196

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Emmanuel Vassilakis

Professor in Remote Sensing & Tectonic Geomorphology

Director of Remote Sensing Laboratory
NKUA, Dpt of Geology & Geoenvironment,

evasilak@geol.uoa.gr

Education

My education at NKUA includes BSc in Geology, MSc in Applied Geology and PhD in Remote Sensing & GIS Techniques. I'm still collaborating with Earth, Atmospheric & Planetary Sciences Dpt at MIT (USA) after appointed for a Post-Doctoral Associate Position during 2006.

Career

2025	Professor National and Kapodistrian University of Athens
2021	Associate Professor National and Kapodistrian University of Athens
2016	Assistant Professor National and Kapodistrian University of Athens
2012	Lecturer National and Kapodistrian University of Athens
2003	Researcher National and Kapodistrian University of Athens
2000	Sergeant (Hellenic Air Force, National Centre of Space Applications)

Research interests

My scientific interests include optical Remote Sensing data processing, Airborne and Terrestrial LiDAR data interpretation, UAS data acquisition and processing, active tectonics, coastline displacement and high precision geodetic techniques, mainly used for surface deformation measurements.

Publications and services

My research work (more than 220 papers) has been published in international scientific journals or conference proceedings and have been cited more than 1240 times. In the most recent publications, my colleagues and I describe techniques for combining UAS and LiDAR data for measuring several geomorphological landforms and processes.

Awards and honors

I have been offered scholarships from GSF for my PhD studies (1996), from MIT for a Post-Doctoral Associate position (2006), as well as for a Visiting Scientist (2018).

Olga-Joan Ktenidou

Associate researcher
Institute and department: National Observatory of Athens (NOA), Institute of Geodynamics, Athens, Greece

olga.ktenidou@noa.gr

Education

2023	Aristotle University Thessaloniki, BA in English Language & Literature
2018	University of Greenwich, Postgraduate Certificate in Higher Education
2010	Aristotle University Thessaloniki, Greece, PhD in Civil Engineering
	National Autonomous University of Mexico, Visiting researcher (2008)
2004	Imperial College London, MSc in Soil Mechanics and Engineering Seismology
2003	Aristotle University Thessaloniki, Greece, Diploma in Civil Engineering

Career

2018–today	NOA, Associate researcher
2016–2018	University of Greenwich, Department of Engineering Science, Senior Lecturer
2015–2016	GFZ German Research Centre for Geosciences, Senior researcher
2011–2014	Université Grenoble-Alpes - ISTerre (France), Postdoctoral researcher
	PEER - University of California at Berkeley, Visiting scholar (2013)
2010–2011	Institute for Radiological Protection and Nuclear Safety (France), Postdoc.

Research interests

Expertise in engineering seismology and strong ground motion: site characterisation and reference station definition, site effects and soil amplification (experimental and numerical study), seismic hazard and ground motion prediction, uncertainty and variability. Interested in geotechnical/earthquake engineering, earthquake reconnaissance, structural response under low gravity and other stuff.

Publications and services

Publication summary: 31 articles in int'l journals, 29 in peer-reviewed conferences, 28 invited talks, 52 intl conf. abstracts, 11 technical reports, 3 book sections.
Pub metrics (GoogleScholar): 1200 citations • h-index=18 • i10-index=34
2020 - today: Head of NOA seismic monitoring and analysis group
2022 - today: Assistant secretary of ESC (European Seismological Commission)
2019 - today: Executive Committee of EFEHR (European Facilities for Earthquake Hazard & Risk)
2018-2022: UAG of ORFEUS (Observatories & Research Facilities fr European Seismology)
2022 - today: Associate Editor for SRL (Seismological Research Letters)
Convener or co-organiser for 15 international conference special sessions
Consulting services for ground motion characterisation for critical facilities & energy sector

Awards and milestones

2020: Top-2 finalist for the British Council's 'Study UK' Professional Development awards in Greece (top 2 out of over 1000 UK graduates since 2004)
2020: Featured alumna, Imperial College London, School of Engineering
(https://www.imperial.ac.uk/alumni/alumni-stories/olga-joan-ktenidou/)
Fellow of the UK Higher Education Academy since 2018

Vasilis Kapetanidis

Assistant Professor
National and Kapodistrian University of Athens
Department of Geology and Geoenvironment
Section of Geophysics and Geothermics

vkapetan@geol.uoa.gr

Education

2005:	BSc in Physics, National and Kapodistrian University of Athens.
2008:	MSc in Geophysics-Seismology, Department of Geology and Geoenvironment, National and Kapodistrian University of Athens.
2017:	PhD in Seismology, Department of Geology and Geoenvironment, National and Kapodistrian University of Athens. PhD thesis titled "Study of spatio-temporal microseismicity patterns for the delineation of active faults' characteristics using the double-difference method and cross-correlation of seismic waveforms".

Career

2017-2024:	Post-doctoral Researcher / Appointed Lecturer at the Department of Geology and Geoenvironment, National and Kapodistrian University of Athens.
2025-today:	Assistant Professor of Seismology, Department of Geology and Geoenvironment, National and Kapodistrian University of Athens.

Research Interests

Seismotectonics, hypocenter relocation, spatiotemporal patterns of seismicity, seismic swarms, repeating earthquakes, velocity modeling, earthquake early warning systems, focus on implementing automatic workflows for seismic data analysis, including machine learning models. He is experienced in seismic station deployment, networking and data management. He has participated in several European and National research projects, including REAKT, HELPOS, INFRASTRESS and GEOINQUIRE.

Publications and Services

52 publications in peer-reviewed international scientific journals, over 100 announcements in international scientific conferences in the field of Seismology. Publication metrics (Google Scholar, as of September 2025): 1702 citations, h-index: 25, i10-index: 48. Selected publications, related to the Gulf of Corinth:

KAPETANIDIS, V., Deschamps, A., Papadimitriou, P., Matrullo, E., Karakonstantis, A., Bozionelos, G., Kaviris, G., Serpetsidaki, A., Lyon-Caen, H., Voulgaris, N., Bernard, P., Sokos, E. & Makropoulos, K., 2015. The 2013 earthquake swarm in Helike, Greece: seismic activity at the root of old normal faults, Geophys. J. Int., 202, 2044-2073. doi:10.1093/gji/ggv249

KAPETANIDIS, V., Michas, G., Spingos, I., Kaviris, G., Vallianatos, F., 2023. Cluster Analysis of Seismicity in the Eastern Gulf of Corinth Based on a Waveform Template Matching Catalog. Sensors 23, 2923. doi:10.3390/s23062923

Serpetsidaki, A., KAPETANIDIS, V., Elias, P., Rigo, A., Spingos, I., De Barros, L., Lengliné, O., Bufféral, S., Karakonstantis, A., Bernard, P., Briole, P., Zahradník, J., Kaviris, G., Plicka, V., Sokos, E., Voulgaris, N., 2023. The 2020–2021 seismic sequence in the Western Gulf of Corinth: Insights on the triggering mechanisms through high resolution seismological and geodetic data analysis. Tectonophysics 863, 230011. doi:10.1016/j.tecto.2023.230011

KAPETANIDIS, V., Spingos, I., Ganas, A., Papageorgiou, A., Kaviris, G., 2024. Relocation of the 2018–2022 seismic sequences at the Central Gulf of Corinth: New evidence for north-dipping, low angle faulting. Tectonophysics 886, 230433. https://doi.org/10.1016/j.tecto.2024.230433

Niki Evelpidou

Professor
National and Kapodistrian University of Athens
Department of Geology and Geoenvironment

evelpidou@geol.uoa.gr

Education

Dr. Niki Evelpidou holds a BSc degree in Geology from the National and Kapodistrian University of Athens, an MSc in "Geography and Environment" from the National and Kapodistrian University of Athens, a PhD on Geomorphology and GIS from the Faculty of Geology and Geoenvironment, National and Kapodistrian University of Athens, and a second PhD on Geoarchaeology from the University of Franche Comte.

Career

2019-today	Professor, Faculty of Geology and Geoenvironment, National and Kapodistrian University of Athens
2014-2018	Associate Professor
2009-2014	Assistant Professor
2003-2009	Lecturer

Research interests

geomorphology
sea level changes
palaeogeography
geoarchaeology
spatial technologies
study and modeling of natural hazards

Publications and services

Her research numbers more than 300 publications in scientific conferences and journals and 28 books and educational textbooks.

She is actively involved in academic, research and educational activities, as she has organized more than 30 educational seminars and training schools while she has participated in the organization of 37 national conferences and workshops, of national and international interest.

Evelpidou N., Karkani A., Kampolis I., 2021. Relative sea level changes and morphotectonic implications triggered by the Samos earthquake of 30th October 2020. Journal of Marine Science and Engineering, 9(1), 40. https://doi.org/10.3390/jmse9010040

Evelpidou, N., Zerefos, C., Synolakis, C., Repapis, C., Karkani, A., Polidorou, M., Saitis, G., 2020. Coastal Boulders on the SE Coasts of Cyprus as Evidence of Palaeo-Tsunami Events. Journal of Marine Science and Engineering 8, 812. doi:10.3390/jmse8100812

Awards and honors

Dr. Evelpidou has received a number of awards and recognitions. Amongst the most significant are two awards from the Academy of Athens: in 2013 for work promoting the geological knowledge of the Greek region for the paper entitled "Evidence of a recent rapid subsidence in the S-E Cyclades (Greece): an effect of the 1956 Amorgos earthquake?" and in 2019 for her monography "Sea level changes".

Anna Karkani

Postdoctoral researcher
National and Kapodistrian University of Athens
Department of Geology and Geoenvironment

ekarkani@geol.uoa.gr

Education
2009   BSc in Geology and Geoenvironment, National and Kapodistrian University of Athens
2012   MSc in Oceanography and Management of Marine Environment
2017   PhD "Study of the geomorphological and environmental evolution of the coastal zone of Central Cyclades"

Career
2020-today   Postdoctoral researcher
2012-2016   Research associate, Faculty of Geology and Geoenvironment, National and Kapodistrian University of Athens

Research interests
Geomorphology, palaeogeography, sea level changes, geoarchaeology, natural hazards

Publications and services
Karkani A., Evelpidou N., 2021. Multiple submerged tidal notches: A witness of sequences of coseismic subsidence in the Aegean Sea, Greece. Journal of Marine Science and Engineering 9(4), 426, https://doi.org/10.3390/jmse9040426.

Evelpidou, N. Karkani, A., Kampolis, I. 2021. Relative sea level changes and morphotectonic implications triggered by the Samos earthquake of 30th October 2020. Journal of Marine Science and Engineering, 9(1), 40. https://doi.org/10.3390/jmse9010040.

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Awards and honors
2020-2021   Scholarship for postdoctoral research by State Scholarships Foundation
2012-2016   Scholarship from National &Kapodistrian University of Athens for PhD studies
2014   DAAD scholarship for training on OSL–Optically Stimulated Luminescence on beachrocks

Akis Panagis

Civil Engineer MSc University of Patras

Monitoring engineer GEFYRA SA

akis.panagis@gefyra.gr

Education
2004: Diploma in Civil Engineering Department University of Patras
2006: Master in Seismic design of structures in Civil Engineering Department University of Patras

Career
2005-2006: Structural modelling and analysis of the lattice roof structure of the archaeological excavation in Akrotiri Santorini (In cooperation with the scientific committee appointed to investigate collapse mechanism) and evaluation of partial collapse mechanism upon dead loading.
2006-today: Structural Designer for various Industrial and residential Buildings composing of different structural system (Steel/Concrete/Timber).
2008-today: Monitoring engineer for Structural Dpt of Rion Antirrion Bridge, involved in the maintenance of Structural Health Monitoring system instrumentation, as well as with the data analysis and engineering interpretation of the records. Engaged with the structural design of Building and maintenance equipment for Rion Antirion Bridge.

Research Interests
Structural modelling, analysis and design of structures, Earthquake structural design, Modal Identification, Ambient structural vibration. Modal Operational Analysis. Sensor technology. Data acquisition. Data analysis Technics.

Publications And Services
Olivier Flamand, Fabrice De Oliveira, Aris Stathopoulos-Vlamis, Panagiotis Papanikolas, Akis Panagis, Using non continuous records from full scale monitoring system for fatigue assessment, EWSHM2014, July 08-11, 2014, Nantes, France

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Vayia Xanthopoulou

Research Associate/ XRF, SEM and Raman technician
University of Patras, Department of Geology and Laboratory of Electron Microscopy
and Microanalysis (L.E.M.M.)

vxanthopoulou@upatras.gr

Education

Dr. Vayia Xanthopoulou is a research associate at the Department of Geology, University of Patras, Greece. She conducted her MSc. and PhD theses in Archaeometric studies and issues that deal with the ceramic analysis and the raw material prospection for the ceramic manufacture.

Career

2015-today	WDXRF, SEM and micro-RAMAN technician, Laboratory of Electron Microscopy and Microanalysis, School of Natural Sciences, UP
2020-today	Research Associate, Department of Geology, UP
2020-2023	Post-doctoral research, IKY, UP
2011-2013	Principal investigator at in C. Caratheodory Funding Programme. Project, UP

Research interests

Her research interests are focused on the characterization of clayey raw materials in terms of their suitability for ceramic production, using various analytical techniques. The raw materials come mainly from Greece (northern Peloponnese, western Greece, western Crete, and Ionian Islands). As a technician in L.E.M.M is responsible for the daily maintenance, calibration and running of samples using the Scanning Electron Microscope (SEM), the elemental spectrometer (WD-XRF) and the spectrometer micro-RAMAN.

Publications and services

She has published ten articles in International Peer-reviewed Journals (some recent are given below) and has participated in more than twenty International Conferences.

I Liritzis, I Iliopoulos, M Kokkaliari, V Xanthopoulou. Novel archaeometrical and historical transdisciplinary investigation of early 19TH century hellenic manuscript regarding initiation to secret" Philike Hetaireia. Mediterranean Archaeology & Archaeometry, 2023

Xanthopoulou, V.; Iliopoulos, I. An Insight into the Suitability of Clayey Raw Materials: The Ceramic Provinces of the Northern Peloponnese and South Epirus, Greece. Buildings 2023, 13, 473. https://doi.org/10.3390/buildings13020473

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ABSTRACTS

Why CRL?

Pascal Bernard,

Institut de Physique du Globe de Paris - IPGP / CNRS, Paris, France

The Western part of the Gulf of Corinth (WGoC) presents a high level of seismic activity known since the ancient times. The geology, sedimentology and tectonics of the Corinth Gulf is studied since the 1970's. After several seismological and geodetic campaigns carried out in the 1990's, the Corinth Rift Laboratory network (CRLnet) was established in the early 2000's, covering first a 30 km × 30 km area with the installation of local networks around Aigio. Due to the important seismicity and aiming to a better understanding of the fault system, the networks increased progressively towards the west, with the participation of many institutions. The present state of the network was reached in 2013 and allows to address scientific questions on the deformation of the crust and the potential for large earthquakes as, for example:

- Migration of the deformation towards onshore and offshore faults.

- Clustering of microearthquakes: dimensions and relationships with the related fault segments and with the occurrence of the main events?

- How can the observed deformation be explained? What is the part controlled by the seismicity?

- What is the role of fluids in the seismicity triggering?

- Can we observe creeping on low dipping normal faults?

To address these questions, CRLnet comprises 80+ permanent stations, equipped with seismometers, accelerometers, Global Navigation Satellite Systems (GNSS), tide gauges and strainmeters. It enables detailed monitoring of the fluctuations of the intense microseismicity and deformation. The seismicity in the WGoC is clustered in time and space, with episodic seismic sequences, for example, the 2003–2004 offshore, the 2013 Helike and the 2015 Malamata swarms, and the most recent 2020-2021 crisis. GNSS recordings and Interferometric Synthetic Aperture Radar (InSAR) revealed the deformation sources of moderate earthquakes and the likely existence of aseismic slip at shallow depth in some places. In addition, significant research has been performed on fault mapping, geomorphology, sedimentology. It is also proposed to specific very detailed studies and methodological experiments. The large number of observations accumulated over the last 10 years has also made it possible to address questions on a wider scale, such as the connection between the WGoC and the Ionian subduction/collision to the west.

CRL is one of the Near- Fault Observatories (NFO) of the European Plate Observing System (EPOS), and the only with an international status. It is administered and maintained by the Centre National de la Recherche Scientifique (CNRS-France), the National and Kapodistrian University of Athens (NKUA-Greece), the University of Patras (UPAT-Greece), and the National Observatory of Athens (NOA-Greece), with the participation of Charles University Prague (CUP-Czech Republic).

Geodynamic setting, large earthquakes and the growth of faults in the western Corinth rift

Ioannis Koukouvelas,

University of Patras, Greece

The Gulf of Corinth is a back-arc extensional basin of the Hellenic Arc which cuts through the Alpine fold-and-thrust belt of the Hellenides and started to develop since Upper Miocene. The western – central Gulf of Corinth (see Figure below) has not experienced a strong earthquake since 1995 (the M_w=6.5 event of Aigion on 15 June 1995), although the Gulf is extending fast (over 12 mm/yr of N-S extension from continuous GPS data spanning a period of 20 years) and its seismic history since 1769 exhibits twelve (12) shallow events with M>6.0. The lecture will present the latest results across several disciplines in solid Earth Science indicating a) the Holocene sea-level and decadal GNSS datasets fit the tectonic model of an active half-graben where the hanging wall (northern coast) subsides and the footwall (southern coast) is uplifted b) the highest uplift rates (3.5 mm/year) are found on the western part of the Gulf, which indicates an asymmetric localization of deformation inside this active rift c) the existence of active high-angle normal fault zones

oriented parallel to the rift axis, d) the continuation of the 1995 low-angle fault towards the west (Psathopyrgos area) and east (Galaxidi), e) the occurrence of earthquake swarms in the hanging wall of the north-dipping, low-angle fault d) new geological and InSAR results mapping ground motions and patterns of crustal extension. The uniqueness of the Corinth rift is revealed by the multi-disciplinarity in geological & geophysical datasets (active fault maps, fault geometry, fault slip rates, trenching data on past earthquakes, historical and instrumental seismicity, InSAR data) and competing models for earthquake generation processes suggested from observed seismicity patterns, geodetic data, magnitude-frequency distributions and fluid migration.
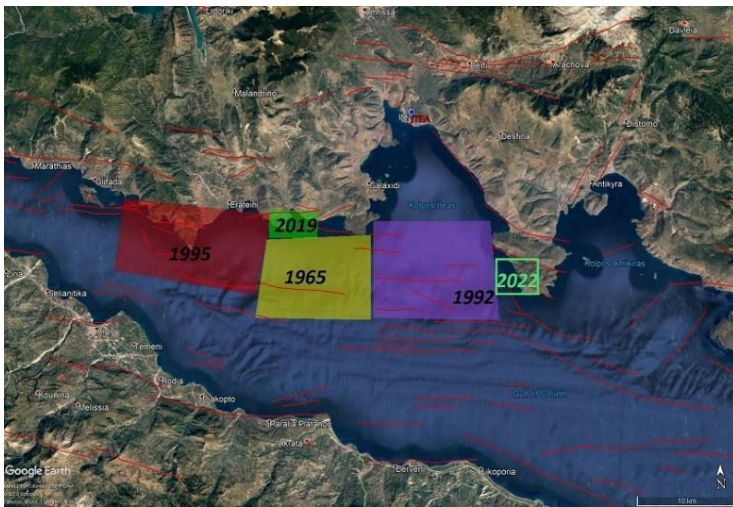
Large Earthquakes and Focal Mechanisms in the Gulf of Corinth

George Kaviris

Associate Professor of Seismology-Seismic Anisotropy,

Section of Geophysics and Geothermics, Department of Geology and Geoenvironment, National and Kapodistrian University of Athens

The Gulf of Corinth is a "natural laboratory" for seismology and geosciences, as it is characterized by high tectonic activity, with the bulk of earthquakes occurring close to its western border. Active normal faults, oriented in an approximately E-W direction, dominate in the Gulf of Corinth. Regarding the morphology of the gulf, it is an E-W trending asymmetric graben, with the major active faults outcropping at the southern coast and dipping north, resulting in a long record of rifting in the center of the gulf and an upward displacement of the main footwalls at both the northern and southern sides. GNSS measurements at the Gulf of Corinth have revealed a high extension rate in a NNE-SSW direction, which increases from the east to the west, i.e. from 11 mm/yr to 16 mm/yr.

Since the historical era, moderate to strong earthquakes have occurred in the western part of the Gulf, including destructive ones, as the 373 BC Helike earthquake that was accompanied by a tsunami wave. Large events have also occurred during the instrumental period, causing severe damage to urban areas in the broader region, e.g. Eratini, M=6.3, 1965; Antikyra, M=6.2, 1970; Galaxidi, M=5.8, 1992; Aigion, Ms=6.2, 1995. Regarding the eastern part of the gulf, large earthquakes are also present, however more rare. In 1981, on February 24, 25 and March 4, a seismic sequence with three major earthquakes of surface magnitudes Ms = 6.7, 6.4 and 6.4 occurred in the Alkyonides Gulf, causing significant damage to Athens. It is worth noting that the seismicity in the WGoC is mostly expressed through the occurrence of seismic swarms, as the one close to Helike in 2013. A seismic crisis occurred at the western part of the Gulf during 2020–2021, which evolved in three stages. It started with an Mw 4.6 event near the northern shore of the Gulf, opposite of Aigion, then migrated eastward toward Trizonia Island after an Mw 5.0 event, and eventually culminated with an Mw 5.3 event, ~3 km northeast of the Psathopyrgos fault.

The intense seismicity in the Gulf of Corinth has resulted in the installation of a permanent network in the area, with stations belonging to the Hellenic Unified Seismological Network (HUSN). Furthermore, the international initiative of the Corinth Rift Laboratory (CRLN) has greatly increased the density of local station coverage and has led to the prompt provision of seismological data to the scientific community.

Data recorded in the gulf are used in a daily basis to locate earthquakes with high resolution. This permits the identification of seismogenic faults through seismological observations, in combination with GNSS and tectonics.

Another important application of the recorded waveforms is the determination of focal mechanisms. This is achieved either with the well-known method of first-motion P-wave polarities, enabled by the dense local station coverage, or through waveform modeling and moment tensor inversion (especially for the stronger events). The majority of the reliable fault-plane solutions indicate normal faulting in an approximate E-W direction, in agreement with the major active faults. However, focal mechanisms in NW Peloponnesus, and some in the Gulf of Corinth, indicate strike-slip faulting.

Off-shore faults imaging and monitoring in the Corinth Rift

Maria Geraga

School of Natural Sciences, Department of Geology, University of Patras, Greece

Acoustic is fundamental energy to the mapping of seafloor. Sophisticated equipment produces sound waves which radiate in all directions away from the source. When the sound waves moving through water hits the sea floor, some of it is reflected, some is transmitted to the seafloor, some is refracted, and some is scattered. The basic components of a sound wave are frequency, wavelength and amplitude. Sound energy is used for the acquisition of seismic profiles and for the seafloor topography and texture. During the seismic profiling the transmitted acoustic energy is reflected from boundaries developed by changes in the acoustic impedance of the subsurface geology. Changes in acoustic impedance (density of the medium times the velocity of the sound within that medium) can generally be thought of as changes in density which indicate transitions from one stratigraphic layer to another. The sub-bottom profilers operate at different frequencies and this has an effect on the depth of acoustic penetration into the seabed and the resultant resolution. The reflected acoustic signal is received by hydrophones or by a transducer. Sidescan sonar is an acoustic device used to provide wide-area, high-resolution 2D images (called "sonographs") of the seafloor. A towing sonar (usually called "tow-fish") emits and later receives the acoustic energy in a specific frequency range. The acoustic energy received by the sidescan-sonar (backscatter) provides information for the morphology of the seafloor and the texture of the sediments covering the seafloor.

In the area of the Corinth gulf, the application of marine geophysical techniques together with extensive onshore studies have revealed significant findings in relation to seismic stratigraphy of the gulf, the rifting development and the evolution of the basin.

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EGU Education Committee: Empowering Geoscience Education

Stavros Stathopoulos

EGU Education Committee Chair

The EGU Education Committee (EC) supports EGU's objective of fostering "the next generation of geoscientists by providing world-class education, training and resources to secondary school teachers, university geoscience educators and early career scientists". During this presentation, information will be provided on the ongoing initiatives, financial support opportunities and freely available teaching materials. There will also be a short demonstration on how attendees can access these resources and stay informed about future engagement opportunities.

Tectonics, structural setting and tectono-sedimentary processes in the Corinth rift

Haralambos Kranis

National and Kapodistrian University of Athens

Department of Geology and Geoenvironment

The Gulf of Corinth (GoC) Rift, one of the most active continental rifts worldwide, which develops within the broader plate convergence context of the Hellenic Arc. Extension and strain localization within the overriding Aegean Plate has led to the formation of this rapidly extending domain. The available data so far point to its inception at ca (?)5 Ma most probably linked to two interrelated processes, namely (i) the onset of the pronounced curvature of the Hellenic Arc; (ii) the propagation of the North Anatolian Fault into the Aegean domain.

The GoC rift has developed in two phases, namely the Rift 1 phase, from 5.0-3.6 to 2.2-1.8 Ma and Rift 2, from 2.2-1.8 Ma to present. Rift 1 is recorded in a >3 km thick syn-rift succession, (Lake Corinth) which shows upward deepening from fluviatile to lake-margin conditions and finally to sub-lacustrine, deposited in a 30 km-wide zone of distributed normal faulting. Rift 2 marks a 39 km northward shift in the locus of rifting, accompanied by footwall and regional uplift, which destroyed Lake Corinth in the central and eastern parts of the rift, while giant Gilbert deltas in the west built into a deepening lake depocenter in the hanging-wall of the newly developing border fault system. Self-organization and strain localization along co-linear border faults are considered to be responsible for the growth, linkage and death of normal faults during these two rifting phases. The major Patras dextral strike-slip fault controls the interaction between the GoC and the Patras rifts; this led to the opening of the Rio Straits at c. 400-600 ka.

The overall landscape and stratigraphic evolution of the rift was strongly influenced by factors related to structure of the Hellenide fold and thrust basement, which controlled regional palaeotopographic variations and local antecedent drainage, the latter especially visible at the southern shoulder or the rift. Along-strike, regional topography north and south of the rift is relatively high in the west, compared to the east; this exerted a first-order control on the depositional environments during rifting. The majority of sediment to the CoC rift has been supplied by north-flowing antecedent catchments on the southern flank. However, the contribution of S-flowing catchments appears to be increasing over time.

On a crustal scale, the extensional thinning of the Hellenide nappe stack, which is observed in the Peloponnesos, is overprinted by the high-angle normal faulting that controls the GoC rift inception and evolution. The interplay between these two processes is another major factor and geochronological and structural data are sought to further constrain rift evolution.

Use of CRL data for detailed seismological studies

Serpetsidaki Anna

University of Patras, Greece

The rift of Corinth in Greece has been long identified as a site of major importance for earthquake studies in Europe, producing one of the highest seismic activities in the Euro-Mediterranean region. The occurrence of earthquakes of magnitude greater than 5, the north–south extension up to 1.5 cm/year, the frequent seismic swarms, and the destructive historical earthquakes, indicate the Corinth rift as an area of major seismological interest, leading in the last decades to the development of the Corinth Rift Laboratory (CRL, http://crlab.eu) project, concentrated in the western part of the rift. The CRL seismological network was installed in April 2000 operating complementary to the existing networks of HUSN (Hellenic Unified Seismic Network) and its primary objective is to provide continuous monitoring of the seismicity and accurate locations of events down to magnitude 1 in order to constrain active structures at depth in this restricted area.

Today the Corinth Rift Laboratory operates a dense seismological array of 11 stations with 2Hz seismometers, 9 stations with broad band seismometers and one antenna of 7 broad band stations. Furthermore, the CRL arrays of gravity stations, tide gauges, GPS stations and meteorology fulfill the objective of continuous monitoring of the area. All seismological stations are transmitted in real time and merged to provide real time earthquake location. The seismological data are available since April 2000 and are both automatically and manually processed in order to study the major events and aftershock sequences but also the seismic swarms, which take place frequently in the area. The various monitoring arrays of CRL have produced new, high resolution, data allowing a better understanding of the seismicity and deformation pattern of the western rift of Corinth, and an improved assessment of the related seismic hazard.

Historical elements for sciences and observatories

Fiori-Anastasia Metallinou

National Observatory of Athens, Institute for Astronomy, Astrophysics, Space Applications and Remote Sensing (IAASARS)

The National Observatory of Athens was established in 1842 and it is the first Research Institute in Greece. An important service it used to provide to public, from 1846 until 1964 was the calculation of the "Official Time of Greece". The "Service of Time" used to be one of the most important services provided by observatories, as well as meteorological measurements and geodynamic studies. During the current talk historical instruments, scientific measurements, data and services provided by an observatory, during the previews centuries, will be presented.

Hand on simple seismic software packages provided on-line in the CRL portal

George Kaviris & Angelos Zymvragakis

National and Kapodistrian University of Athens

Department of Geology and Geoenvironment

Section of Geophysics and Geothermics

Introduction to Phase Picking with SeisGram2K

Accurately identifying and determining the arrivals of seismic phases is one of the fundamental analysis routines in seismology. From event location to seismic tomography, arrival times of different phases (commonly called "picks" in the seismological community) form the basis of most advanced processing techniques and statistical analyses. In this exercise, we will learn to identify the arrivals of longitudinal (P) and shear (S) waves in local recordings of the Corinth Rift Laboratory Network. We will then use their arrival times to locate an earthquake. The goal of this exercise is to pick the arrival times of P and S phases in at least three stations and, then, find the epicenter of the earthquake.

Triangulating the location by using travel-time curves is one of the simplest (and least accurate) methods to find the position of an earthquake. Modern location techniques involve sophisticated software that use tens or hundreds of phase arrivals.

Sky gazing

Fiori-Anastasia Metallinou

National Observatory of Athens, Institute for Astronomy, Astrophysics, Space Applications and Remote Sensing (IAASARS)

During this activity we are going to observe the constellations of the night sky and some planets of our solar system. The brightest stars visible by naked eye and their characteristics will be mentioned. The connection between the constellations and the Greek mythology will be presented.

A concise overview of the lithostratigraphy architecture and its implications to the Quaternary evolution of the Gulf of Corinth (Greece)

Petros Koutsovitis

University of Patras, Department of Geology

The Gulf of Corinth is located in central Greece, is a bathymetrically restricted marine elongated embayment, extending as long as ~105 km at an E-W direction. It displays a width of ~320 km, with the deepest water depths being identified at the central parts of the Gulf, reaching even up to 1 km. It comprises of Quaternary marine terraces, as well as hanging-wall surface subsidence and Gilbert-type fan deltaic sedimentary formations. It is considered as one of Earth's most active basin systems that includes three basement offsets, namely the Akrata-Derveni, Sithas and Xylocastro. Specifically, regarding that of the Akrata-Derveni, the common tripartite has been identified, which includes the topset, foreset and bottomset formations. The large Gilbert-type fan deltas correspond to the Middle Group of the Corinth Rift infill, with their lithostratigraphy being highly affected by the active evolution of the rift structure. Eight facies associations have been identified, denoting an evolution from deep to shallow marine environment. Thus, the Lower and Middle Groups (fluvio-lacustrine deposits and thick alluvial fan conglomerates) are characterized by an overall increase in accommodation space at the deposition stages, followed by a significant decrease in sediment supply during deposition of the Upper Group (mainly uplifted terrace deposits and slope breccias).

"The MET Museum Kits on Water as an Educational Tool"

Peny-Theologi Gouti and Maria Kostourou, Science and Technology Museum, University of Patras, Greece.

Understanding the importance of water for daily life, the environment, and sustainable development, the Science and Technology Museum (STM) of the University of Patras, Greece, developed a campaign to increase its outreach and empower awareness, interest and knowledge on sustainability and the value of fresh water. The creation of six museum kits (MKs) form the core of this campaign, that also includes photo contests and participation in science events-celebrations.

Each MK was designed to accommodate specific educational requirements and cover all levels of school education, from pre-school to secondary education. MKs contain materials, reagents, scientific equipment, digital educational resources and instructions for teachers. Each MK features a playful story and several generative, active learning activities that can be customized by teachers to facilitate the needs of their class. As portable suitcases they are being lent to interested school units to implement and play them. Educators are encouraged to contribute their own ideas, extensions and variations in a virtual community of practice, hosted by STM. Moreover, evaluation data and teachers' feedback are being collected to assess the effectiveness of MKs. Preliminary results indicate high levels of satisfaction on behalf of teachers and students and evidence of empowering awareness on freshwater value. MKs comprise a practical strategy for museums to provide knowledge transfer and equal access learning opportunities to remote audiences and schools, to extend and enhance the visibility of academic discourse and thus increase the awareness of coming generations on water sustainability.

Live data education: the real time experience and the earthquake suitcase

Dr. Vasiliki Kouskouna
Professor Emerita, National and Kapodistrian University of Athens
Dr. Nikolaos Sakellariou, National and Kapodistrian University of Athens

The Earthquake Suitcase, an educational system for information about - and familiarization with – earthquakes, was designed and integrated in the Laboratory of Seismology, Department of Geology and Geoenvironment of the National and Kapodistrian University of Athens.

Using live data in school science lessons adds relevancy and real-world experience to classrooms. School students are trained to observe real-time earthquake data and to produce their "own earthquake" using a portable shake table and Raspberry Shake and Boom devices.

The educational material is included in the "Earthquake Suitcase", which contains interactive educational toys, an experiential shake table for earthquake simulation with a 3-D accelerometer recording the simulation in real time and model buildings if different vulnertability, books, leaflets and an earthquake emergency bag.

Prior to school visitations, teachers participate in virtual trainings to learn about how the accelerometer and the Raspberry Shake and Boom devices can be used to both to simulate earthquake data, as well as record actual seismic activity and upload it to a global network of live data. Teachers and students can access the real-time data from all over the world, including stations in their area, and use this data for classroom instruction.

During classroom lessons, students participate in the simulations and learn how to interpret seismograms, including using P-wave and S-wave intervals to triangulate an epicenter and relate concepts such as amplitudes and duration to a seismogram for magnitude determination.

The multiple goals achieved with such educational activities are to educate students of all age groups on what an earthquake is, where, how and why earthquakes occur, as well as the preventive measures that can be taken. The schoolchildren gain experience though earthquake simulation by creating their own earthquake, familiarize themselves with the feeling of an earthquake, and learn to take the necessary self-protection measures.

The training is conducted by the specialized staff of the scientific team. During the training and, in collaboration with the educators in charge, the effectiveness of the Earthquake Suitcase is evaluated, with the students drafting their own family emergency plan.

Results from educational applications to schools in Greece and the US, the Researcher's Night and the Athens Science Festival are presented.

Discovering the dynamics of Corinth Gulf

Mpakopoulou Athanasia,
Assimina Antonarakou,
National and Kapodistrian University of Athens, Greece

This is an educational scenario of how to communicate the dynamics of Corinth Gulf to students at secondary school. The approach is student-centred incorporating team, real-problem- and inquiry-based activities. The aim is to provide students with educational techniques and tools to develop basic thinking skills to observe, inquiry, elaborate and assess field observations, to interpret and use interactive maps, and finally to interrelate data and come to conclusions for the evolution of Corinth Gulf. Due to the use of digital tools with real time data in global scale, the lesson plan can be continuously updated and adjusted in each place so that students can explore the evolution of their own environment at any time and any place.

# Introduction to the Differential SAR Interferometry for measuring ground deformation

Panagiotis Elias

National Observatory, Athens, Greece

How can we measure a seismic fault buried many kilometres under the ground from 600km away? How can we map a displacement of a few mm or cm from such distances? The technological advancements of the recent decades in the remote sensing permitted the sensing and measuring of the deformation of the earth crust due to earthquakes, aseismic tectonic processes, volcanoes and landslides but also to manmade activities. How can we link the deformation of the surface to the fault in depth through modelling? The basics of the satellite Synthetic Aperture Radar (SAR) characteristics and properties of its provided data as well as the basics for differential and multi-temporal interferometry methodologies will be presented. Links with the presentation of GNSS will be shown. We will focus on the case of the Corinth Rift Observatory area and present our findings so far.

The Corinth Rift is one of the narrowest and fastest extending continental regions worldwide and has one of the highest seismicity rates in the Euro-Mediterranean region. At its western termination, several active faults are located beneath the city of Patras and the surrounding area, a region of major socio-economic importance to Greece.

Apart from moderate earthquakes striking often, additional non sudden geological phenomena, such as slow and continuous ground displacements, are occurring. Both are being provoked by the movement of the tectonic plates. In many cases slow displacements are part of the seismic cycle occurring before an earthquake.
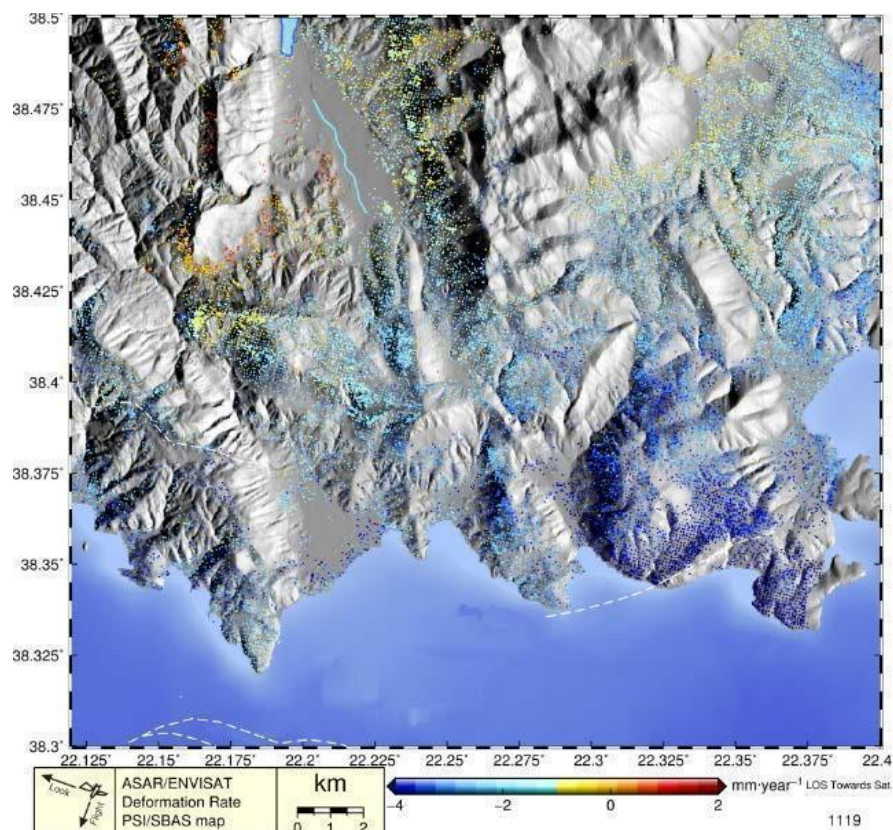
Velocity map produced from ASAR/ENVISAST Multitemporal interferograms of Psaromita and Galaxidi area in the North Gulf of Corinth. The coast of Central Greece is moving away from the coast of North Peloponnesus with a maximum velocity of about 1.5 cm per year.

Application of GNSS to seismotectonic studies

Vassilis Sakkas

National and Kapodistrian University of Athens

Department of Geology and Geoenvironment

Section of Geophysics and Geothermics

Satellite geodesy (GPS/GNSS) and satellite radar Interferometry (InSAR) are the main techniques that are been used over the last few decades to study ground deformation in tectonic active areas. In early 90's the Department of Geophysics and Geothermics of NKUA started to install several local benchmark GPS networks in tectonic active areas of Greece in an effort to study and monitor the ground deformation due to tectonic and seismic forces. On the framework of this work small local GPS networks were established in Patras Gulf (1994) in Cephallonia and Ithaca Islands (2001) and to Zakynthos Island (2005). These networks were designed aiming to study the ground deformation in both local and regional scale. The number of the benchmark stations and their position was selected in a way to fully cover the study areas, measuring the ground deformation along major/regional and minor/local faulting zones and also to study motion of the neotectonics blocks that were defined in the selected areas. The networks were remeasured periodically, and after few re-measurement periods that lasted 5-10 years, provided sufficient evidences of both the regional and local kinematic regime of the study areas. When strong seismic events occurred in the vicinity of the GPS networks the results offered more insight on the activated faults. The displacement vectors associated with the co-seismic motions as well as with the post-seismic relaxation period were the main elements to describe the motions along the seismogenic fault planes, via modelling procedures. Moreover, special effort was given to define pre-seismic displacements that could be associated with the forth coming seismic events, in order to contribute to the earthquake prediction studies.

Based on the GPS results from the local networks in Patras Gulf and in central Ionian Islands regional and local scale motions were detected and interpreted jointly with the tectonic, geologic, seismic and interferometric data that were available aiming to define the seismic status of the study areas. Pre-seismic motion patterns were defined, co-seismic displacements were calculated and post-seismic relaxation behavior was identified in the complex tectonic environment of the western Greece.

Since 2008 in the broader area of Patras Gulf and Central Ionian islands permanent GNSS stations were started to established providing a daily image of the ground motion, and accurately define the velocity field of the area. The data from the permanent GNSS stations were elaborated with the campaign data providing a more detailed image of the ground deformation occurred in this area, as well as the strain filed that is controlled by the local and regional tectonism.

The combination of the satellite geodetic data (GPS/GNSS) with the interferometric results succeed to accurate map the spatial and temporal ground deformation and kinematic status of the Central Ionian and Patras Gulf, providing crucial tools towards the better understanding of the current seismic status of the area. The results are expected to enable the scientists to better evaluate the seismic and associated hazards, in such tectonically active areas and planning processes in respect to minimis damages from future strong seismic events.

Multitemporal monitoring of active faults with close-range (t-LiDAR, UAS) remote sensing equipment

Emmanuel Vassilakis

Professor in Remote Sensing & Tectonic Geomorphology, NKUA

In recent years, close-range remote sensing techniques—particularly the interpretation of point cloud data obtained via terrestrial laser scanners and drones—have increasingly been employed for the three-dimensional documentation of active fault surfaces. These methods enable the detection of micro-movements and displacements occurring along fault planes. When applied in a diachronic monitoring framework, the integration of such techniques provides valuable insights into landscape evolution, particularly in relation to surface modifications caused by fault activity.

Quantitative analysis of Digital Surface Models (DSMs) acquired over multiple time periods, using advanced 3D software, allows for the detailed visualization of the geometric features of fault surfaces, as well as the associated geomorphic processes (e.g., rockfalls, displaced notches) triggered by fault slip events.

The Gulf of Corinth is bordered by numerous active faults that significantly influence the morphology of the coastal zone. One prominent example is the Psatha Fault, situated along the gulf's eastern margin. In June 2011, a terrestrial LiDAR survey was conducted to document the micro-topography of the fault surface and the debris partially covering it. A subsequent survey in July 2022 focused more specifically on the contact zone between the carbonate fault surface and the overlying debris, where notable rockfalls and slope failures were observed in comparison to earlier data.

Through a series of volumetric analyses, distinct masses of rock material were quantified—either relocated onto the hanging wall due to rockfall activity or accumulated as loose debris. These morphological changes are attributed primarily to extreme weather events and/or minor seismic activity, both of which remain frequent in the highly tectonically active region of the Gulf of Corinth.

Open Seismic Data Retrieval through EIDA Nodes and Automated Moment Tensor Analysis

Christos P. Evangelidis

Institute of Geodynamics, National Observatory of Athens

ORFEUS (Observatories and Research Facilities for European Seismology) EIDA (European Integrated Data Archive) is a collaborative initiative aimed at facilitating access to seismological data across Europe. It serves as a centralized platform for storing and distributing seismic data collected by numerous research institutes and observatories within the European seismology community. EIDA implements webservices to provide standardized and open access to data. These include FDSN standardized webservices for mSEED waveform data, station metadata and data availability. Additional EIDA specific standardized webservices for routing between services and for waveform metadata ensures a centralized point of entrance into the federated infrastructure and user specific quality checks on the actual data. EIDA plays a crucial role in promoting data sharing, fostering international collaborations, and enabling advanced research in seismology. By providing a standardized and easily accessible data infrastructure, EIDA contributes to a deeper understanding of Earth's structure, seismic hazard assessment, and earthquake monitoring efforts.

The availability of near-realtime seismic waveform data from many European countries with dense seismic networks allows the application of semi-automatic fast processing workflows that can be triggered after significant earthquakes. GISOLA is one tool that determines automatically moment tensors (MT), essential for real-time seismological applications. It is a highly evolved software for MT determination, oriented toward high-performance computing. It employs enhanced algorithms for waveform data selection via quality metrics, such as signal-to-noise ratio, waveform clipping, data and metadata inconsistency, long-period disturbances, and station evaluation based on power spectral density measurements in parallel execution.

The National Observatory of Athens (NOA) functions as a primary EIDA node, catering to seismic networks in Greece, Cyprus, and Montenegro. It plays a crucial role as the developer of GISOLA software and has integrated it into the datacenter, enabling quick determination of moment tensor (MT) solutions for earthquakes in Greece and the surrounding areas with magnitudes exceeding 3.5Mw. The MT database contains numerous solutions starting from 2012 onwards.

Seismic hazard in Greece with a focus in the Western Gulf of Corinth

Angelos Zymvragakis

National and Kapodistrian University of Athens

Department of Geology and Geoenvironment

Section of Geophysics and Geothermics

Seismic hazard describes the natural phenomena generated by an earthquake, such as ground movement and fault rupture. The catalyst of possible secondary phenomena is ground motion. Seismic Hazard Assessment (SHA) is an effort to quantify seismic hazard and its associated epistemic uncertainties. This quantification process is executed by the computation of Peak Ground Acceleration, Velocity (PGA, PGV) and others. There are two main ways to perform SHA. The first is called Probabilistic Seismic Hazard Assessment (PSHA), and the second is Scenario-Based Seismic Hazard Assessment. The first, uses an earthquake catalog and a seismotectonic model and the results are generated for certain return periods. On the other hand, Scenario-Based considers a single fault rupture without a specific time frame.

Greece possesses a significant seismic hazard (Danciu et al., 2021). This can be attributed to the direct contact of the European and African tectonic plates in Southern Greece, with Africa subducting beneath Europe. Positioned to the north of this subduction zone is the Gulf of Corinth, which is an active rift that is expanding in a North-South direction. This particular seismotectonic configuration is accountable for the frequent occurrence of numerous earthquakes, positioning Greece among the European countries if the highest seismic hazard. As a result, the entire nation, or specific areas within, have served as focal points for numerous seismic hazard studies.
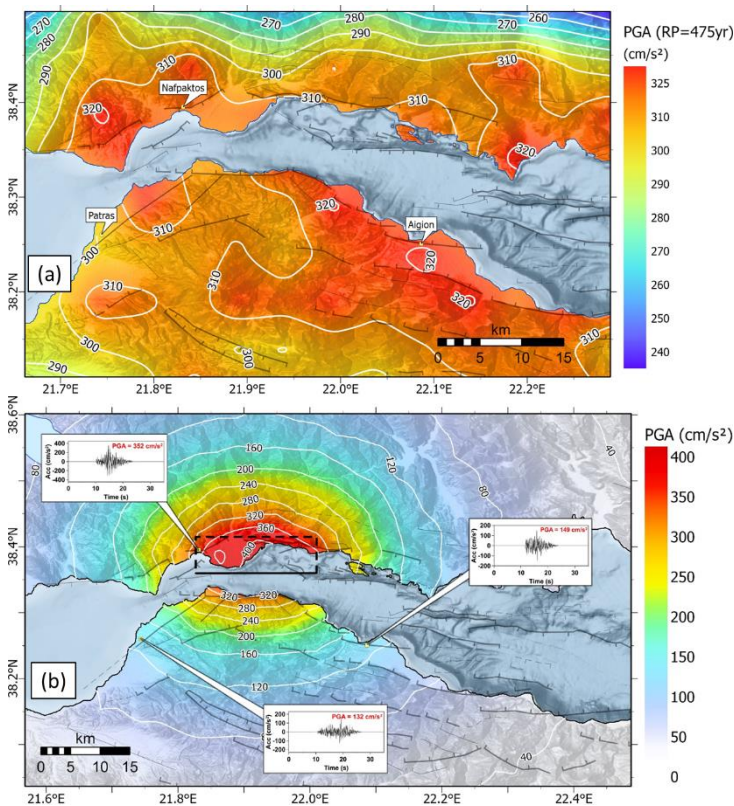
In recent study conducted by Kaviris et al. (2022) the seismic hazard of western Gulf of Corinth was assessed using both the probabilistic and the scenario-based methodology. In the initial approach, a range of input data variations were considered to address epistemic uncertainties through computational variability. The outcomes of the PSHA demonstrated that the land in proximity to the gulf exhibit elevated PGA values, which decrease towards the south and north for a 475-year return period (Figure a). The subsequent approach comprised two main components. The first involved parameter optimization, wherein simulated and recorded PGA values of the most recent strong (Mw ≥ 6.0) earthquake in the study area; namely, the 1995 Aigion MS = 6.2 mainshock were compared. This comparison was conducted to adjust input data such as the stress parameter. The second component pertained to simulating strong ground motion for hypothetical rupture scenarios, one of which was the Psathopyrgos Fault (Figure b). The results indicated that the highest PGAs, situated at the surface projection of the fault or in close proximity, exhibited relatively consistent values ranging from approximately 350 to 450 cm/s².

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Physical mechanisms behind seismic site response - Some examples from Aegion

Olga-Joan Ktenidou

National Observatory of Athens, Institute of Geodynamics

This short lecture will show us how analyzing a large number of earthquakes recorded at a seismic station can reveal particular characteristics of that site's seismic response. Coupling such an analysis of recorded data with numerical tools -where the site's geometry and soil properties are modeled in 2 dimensions as a grid and a seismic input is propagated through it- can help us validate our observations on the data and explain the physical mechanisms behind the observed site response.

We will look at examples from a study performed on over 500 earthquake records from a vertical array of acceleromteters in Aegion, Greece. The array is installed inside an alluvial basin and it includes five stations all at different depths, so as to record ground motion in various kinds of soil as well as in the underlying rock. Aegion, which is situated in the Gulf of Corinth, is a location of high seismicity and so during a few years, hundreds of earthquakes were recorded by this array. The array was installed inside the basin in order for the recordings to shed light on how this complex geological feature affects seismic ground motion at the surface, which in turn can affect the seismic response of the structures and infrastructure in the vicinity.

We estimate site effects using the technique of empirical spectral ratios, with and without a reference site (standard and horizontal-to-vertical spectral ratio). We find significant site amplification which cannot be accounted for by 1D model predictions, and also a significant difference between the two horizontal components. These are indications that the response is dominated by 2D effects, due to strong surface waves generated at the basin edge and propagating laterally towards its interior. Our numerical model simulations corroborate the results of our empirical data analysis and can help inform us about the geological features that cause the various features of the site response. The strongest amplification takes place in the direction parallel to the basin edge, and is up to 2 times higher than in the perpendicular direction. We link this to the nature of surface waves, the Love waves generated being stronger than the Rayleigh waves. We also consider different time windows to study the effect on different wave packages, such as S-waves and coda.

Finally, we make some comparisons with the way the European seismic design code (Eurocode-8) addresses and -of necessity- simplifies such complex phenomena. We compute soil-to-rock amplification factors for peak ground acceleration and find hey are significantly higher than what is predicted by current design codes. With that opportunity, we make a short overview of the limitations in predicting complex ground motion based on simple proxies.

Applications of Machine Learning in Seismology

Vasilis Kapetanidis

Section of Geophysics and Geothermics, Department of Geology and Geoenvironment, National and Kapodistrian University of Athens

Machine learning methods, and deep learning models in particular, are among the most important tools for seismological applications at the cutting edge of today's technology. Compared to conventional approaches, deep learning models are more efficient, more flexible, more accurate in their estimates, more sensitive, more reliable, capable of processing large volumes of data, and more accessible. This lecture introduces the basic concepts of Artificial Intelligence (AI), Machine Learning (ML), and Deep Learning (DL). While all involve computer programs carrying out automatic tasks that humans would otherwise perform, ML systems can "learn" from large datasets. Specifically, "supervised learning" concerns models that are "trained" using previously labeled data, i.e., input data for which the desired answers (output) are already known. DL models are artificial neural networks containing multiple hidden layers, mimicking their biological counterparts. This makes them exceptionally good for pattern recognition tasks, such as the analysis of seismic waveforms, where their precision can be comparable to that of a human expert.

Several widely used machine learning tools for seismological applications are presented, all freely available as open-source Python code. The PhaseNet DL model (Zhu & Beroza, 2019) detects P- or S-wave arrivals in continuous seismic recordings. Its outputs are two time-series, representing the probability densities for a P- or S-wave arrival, respectively. The EQTransformer DL model (Mousavi et al., 2020) uses an "attention-based" mechanism to first detect events, weighing in on the earthquake signal, i.e. the most important part of a seismic record, then focusing on the P- and S-waves, just as a human expert would. The DeepDenoiser DL model (Zhu et al., 2019) distinguishes the seismic signal from the background noise, enabling even weaker events to be analyzed. To obtain a seismic catalog, the GaMMA ML method (Zhu et al., 2022) associates the correlated P and S picks with an event's origin, based on the physical constraints of arrival moveout with distance. Finally, the DiTingMotion DL model (Zhao et al., 2023) characterizes the polarity (compressional or dilatational) and clarity (impulsive or emergent) of the P-wave first motion polarity (FMP) on the vertical component of each station, enabling focal mechanism determinations for weak magnitude earthquakes.

Examples from the application of the above-mentioned ML methods are presented, with a particular focus on the December 2020 – February 2021 seismic crisis in the Western Gulf of Corinth (Serpetsidaki et al., 2023). The created "deep catalog" contains over eight times more earthquakes than the one derived from detections using conventional methods and routine manual analysis. Likewise, the detectability of smaller earthquakes is increased, as exhibited by the reduction in the completeness magnitude in the deep catalog. This increases both the spatial and temporal density in the seismic catalog, providing a better image of the spatio-temporal evolution and highlighting hidden small activated structures at depth. The application of the DiTingMotion model shows promising results, providing focal mechanisms that are comparable to those derived through manual FMP characterization. Finally, more applications are presented for the seismicity in the Ionian Islands, as well as for the recent seismic crisis in the Santorini-Amorgos zone.

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Relative sea level changes in the Corinth Gulf during the late Holocene

Niki Evelpidou & Anna Karkani

National and Kapodistrian University of Athens

Department of Geology and Geoenvironment

Remains of past sea levels, such as tidal notches, benches, beachrocks, etc. may provide valuable information for the investigation of relative sea level changes of eustatic and/or tectonic origin. Tidal notches are usually formed in limestone cliffs in the mid-littoral zone, are well known as precise sea-level indicators and they can attest to the modality of sea level change (rapid or slow) allowing to identify palaeo-seismic events.

In this presentation, we focus on case studies of earthquake-driven coastal changes from the Corinth Gulf, where impacts of past earthquakes can be traced mainly through tidal notches. A reanalysis of published measurements of submerged and uplifted tidal notches in the Corinth Gulf may provide useful indications concerning the long-term tectonic trends that are active in the study area.

Earthquake structural response of Rion Antirrion Bridge: 15yrs of continuous structural surveillance through permanent instrumentation system

Akis Panagis

GEFYRA SA

Rion-Antirrion Bridge is a multi-span cable-stayed bridge with a total deck length of 2,252m fully suspended from the pylons top located on an area of significant seismicity (West Corinth Gulf). During structural design phase unique solutions were implemented to mitigate consequences of a major earthquake event and to allow significant ground displacement without extensive restoration actions.

Rion Antirionbridge in in operation since 2004 and over this period more than 30 earthquake events, yielding to noticeable structural excitation, have been recorded through the instrumented monitoring system that is permanently installed. The intensity of events ranges from small events at the vicinity of the structure –having epicenter distance less than 10 km to major events at an epicenter distance exceeding 250 km (JAN 8th 2006 Kythira Event).

Current presentation discusses the structural response of Rion Antirrion Bridge focusing on apparent differences observed for different earthquake events while JUN 08th 2008 Achaia-Ilia EQ consequences are extensively presented since this was the most severe event up to now.
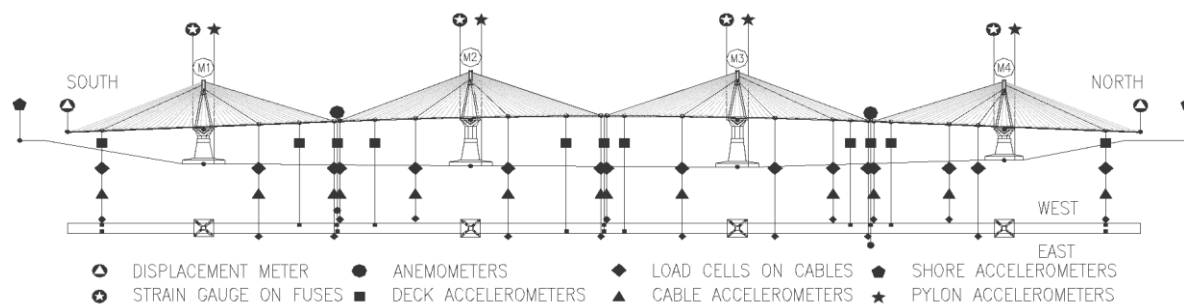
Rion Antirrion Bridge SHM Instrumentation.

Recent sedimentary processes in the western Gulf of Corinth, Greece: seismic and aseismic Turbidites

Spyros Sergiou

Laboratory of Marine Geology and Physical Oceanography, Geology Department, University of Patras, Greece

The Corinth rift is counted among the most active tectonic grabens in the world, with extension rates up to 15 mm/yr (Western part). These high extension rates are associated with very strong seismic events that are, occasionally, responsible for submarine mass movements. These movements, their consequential bottom currents, and the differential river-discharging sediment accumulation in the whole gulf, strongly affect the modern marine sedimentary processes. The definition and understanding of these processes is the main aim of this project. This is attempted through via sedimentological, mineral and geochemical analyses on two gravity sediment cores from a WE submarine canyon (10 km long, 3 km wide) that lies in the Western tip of the gulf. The general sedimentation motif reveals the presence of hemipelagic deposits which are occasionally interrupted by sandy turbidites. A number of these turbidites correlate with past seismic events. The sedimentation rates range between 2.57 mm/yr in the western part and 0.67 mm/yr in the eastern part.

Laboratory class: Study of Archaeomaterials in "KERAMos Lab

Ioannis Iliopoulos[1] and Vayia Xanthopoulou[1,2]

[1]Department of Geology, University of Patras, Greece

[2] Laboratory of Electron Microscopy and Microanalysis, University of Patras, Greece

The KERAMOS research group adopts an interdisciplinary approach to tackle archaeological challenges by conducting scientific investigations into material culture and the related Earth's mineral resources. For the past decade, the group has been actively engaged in Archaeometric research at the Department of Geology, University of Patras. Our research endeavours encompass the study of cultural artefacts from diverse regions and historical periods, spanning from the Paleolithic to the modern era. Accredited methods are employed to sample, analyse, and assess clays, sands, and rocks, determining their suitability as raw materials for ceramic production and their use for stone artefacts. To address archaeological inquiries, the group utilizes non-destructive and minimally destructive analytical techniques for ceramics, stones, metals, glass objects, and historical manuscripts.

In our lecture, we are going to present you briefly how an archaeometric research is conducted through several case studies, which are either completed or on going. We will begin from the sampling campaigns, the laboratory processes, the applied analytical techniques, the results and how these contribute to responding to the archaeological questions.

Field trip to the Helike fault

Emmanuel Vassilakis

National and Kapodistrian University of Athens

Department of Geophysics and Geothermics

The Helike fault is the most prominent high-angle, normal fault on the south side of the western Gulf of Corinth (Fig. 1). It is well visible in satellite images, air-photos, DEMs and it forms impressive footwall landscapes. Its seismic potential is M=6.8 (Doutsos and Poulimenos, 1992) and its probabilistic rupture forecast for the next 30-yr is among the highest in this region of central Greece (Ganas et al., 2014). It is divided into two north-dipping segments with a right step near the exit of the gorge of the Kerynitis river (Koukouvelas et al 2001; Pavlides et al. 2004). The western fault segment bounds a thick sedimentary basin (a few hundred metres) and it has cut across incised streams, however the fault scarp is less pronounced. The eastern fault segment has a total length 24-26 km (20 km onshore and 4-6 km offshore). It ruptured on 26 December 1861 during the famous Helike earthquake that created surface breaks for a distance of 13 km (mapped from Julius Schmidt, then NOA Director) with a vertical displacement up to 1 m. Paleoseismological data showed that the eastern segment was activated three times during the last 2000 years, including that of the 1861 event. The event magnitude was estimated at M=6.7-6.8 and most probably they occurred sometime between 190BC-110AD the former, and around 600AD the latter. Based on the radiocarbon dating of the sediments the slip rate increased dramatically after a strong earthquake event near 1400BP. The faster slip rate evidently increased the sedimentation rate. The average slip rate on the fault over the past 2000 years is estimated at about 1.5 mm/year while the horizontal extension accommodated from this fault is about 1 mm/year. The field visit will focus on scarp morphology (Fig. 2; sketch by Koukouvelas and Papoulis), fault plane geometry and kinematics of one prominent site (Kalanteri), to the east of village Selinountas.

Figure SEQ Figure * ARABIC 1. Field view of the eastern Heliki fault. Source: helikeproject.gr

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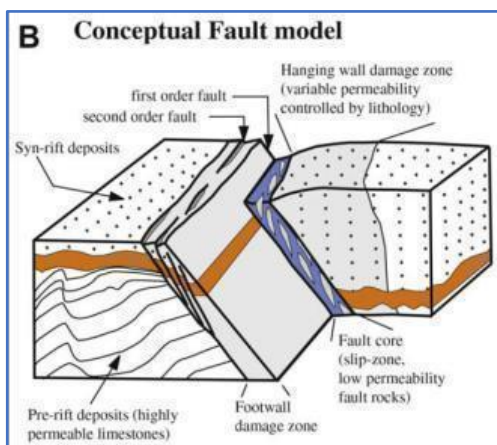
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Introduction to satellite SAR interferometry

Panagiotis Elias

National Observatory, Athens, Greece

During the last two decades, the scientific community observed a growing number of permanent GPS networks developed for monitoring the evolution of the deformation in active tectonics and volcanic areas. This development was performed at different spatial scales depending on the investigated target, i.e. from a single fault system or a volcano to regional or plates kinematics. Furthermore, thanks to the continuous technical development of the instrumentation, the frontiers of the studies on the deformation have been pushed also at different temporal scales, i.e. from years for the detection of long-term strain accumulation to seconds (and even below) for observing and modeling earthquake sources or dike intrusions and for early warning applications. The capability to observe a target geophysical phenomenon (i.e. plate movement, earthquake deformation or ground motion, volcanic deformation) strongly depends on the effort for planning the monitoring network and on the characteristics of the chosen instrumentation. Further steps are represented by the data analysis and the interpretation of the results. Different GPS data analysis strategies can be adopted for monitoring the deformation of a given target (Precise Point Positioning, Double-Difference, Real-time Kinematic). All of these strategies have their advantages and disadvantages, in terms of noise level (and then accuracy) and reliability with respect to the investigated phenomenon, that should be taken into account for an actual, aware and rigorous interpretation of the obtained results and products. In this presentation, some examples of science-driven GPS monitoring networks will be shown, from their conceptualization to the instrumentation. Examples of data analysis strategies, related accuracies and results will be also described.

Seismic Parameters and Microseismicity in the Gulf of Corinth

Vassilis Karakostas & Eleftheria Papadimitriou

Aristotle University of Thessaloniki

School of Geology

Geophysics Department

The Gulf of Corinth is one of the most seismically active areas in the Mediterranean area, associated with extensional crustal faulting. The Gulf has the general shape of an asymmetric half–graben with the southern footwall being uplifted. Its western end is connected through the Rio–Antirrio strait to the Gulf of Patras, which does not have any major faults comparable to the ones affecting the Gulf of Corinth. The eastern part truncates the Megara basin through a complex pattern of faults with a more NE–SW strike. The geodetically measured N–S extension is about 15 mm/yr in the western part, around Rio, and about 10 mm/yr in the eastern part, around Corinth. A comparison between several GPS surveys measured over shorter duration gives slightly higher values, but with the same difference between the western and eastern ends of the Gulf. It therefore seems clear that the present deformation is relatively well confined in the center of the Gulf on a very narrow deforming zone.

Information on the strong (M$\geq$6.0) earthquakes in the study area is available for more than 25 centuries. They may be considered as characteristic ones, associated with certain fault segments independently of their epicentral uncertainties. Their occurrence rate reveals that all M$\geq$6.0 earthquakes are included in the regional catalog since 1700 AD, and they occur in clusters. The dimensions of the fault segments do not exceed 20 – 25 km, which implies an upper limit for the magnitude of the earthquakes that can occur on an individual fault segment. The last M$\geq$6.0 earthquake to rupture the area occurred in 1995 and is associated with Aigion fault segment.

Accurate determination of the source parameters of microseismicity is crucial in understanding the seismicity evolution. The spatial and temporal evolution of the abundant low magnitude shocks can be used to define thoroughly the seismotectonic properties of the area which are related with the occurrence of strong earthquakes. We use the P and S phase picks of the recordings at the stations of the Hellenic Unified Seismological Network (HUSN), which is rather dense in the broader area particularly in the central and western part of the gulf. Initially shocks are located by the hypoinverse program using a one dimension local velocity model of the P waves, the Vp/Vs ratio and travel time corrections to take into account lateral heterogeneities of the model. Then, the double difference technique is applied to relocate the events. In the final step, cross–correlation differential travel times derived from phase–picked data and waveform cross–correlation are included. Jointly relocated data have reliable relative positions. Focal mechanisms based on the first motion polarities exhibit mostly normal faulting on almost E–W striking nodal planes. For the M>3.0 moment tensor solutions are determined. Both, the spatial distribution of the earthquakes and their focal mechanisms, show a dominant strike of 270º in the westernmost part changing to 270º – 290º at the center of the Gulf, perpendicular to the almost N–S extension of the rift. Further to the east, a gradual change in fault orientation is observed. In the easternmost part, the strike becomes 240º, in agreement with the geometry of the rift.

The spatial and temporal evolution of the microseismicity is thoroughly investigated and remarkable characteristics, among which similarities and differences have been found. To better understand the microseismicity evolution both the seismicity rate change and the static stress changes due to the coseismic slip of the stronger earthquakes are examined. Since the early days of detailed seismic monitoring of the area, frequent earthquake clusters or swarms have been recorded. These swarms are mostly located in the western part of the study area, in shallow depths and associated with different north or south–dipping fault segments. The seismicity in the shallow north–dipping seismic zone is continuous and free of earthquake clusters, probably defining the boundaries between brittle and ductile layers.