

## DAVIDE GEI

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### Vital data

Date of birth: May, 29<sup>th</sup> 1970  
Place of birth: Trieste - Italy  
Nationality: Italian

### Education

1993-1998 Degree (MSc) in Geological Sciences with final thesis in Applied Geophysics, University of Trieste - Italy. Title of thesis: "Advanced seismic processing, seismic attribute analysis and interpretation of a crustal seismic line in the Central Adriatic Sea". The final project concerned the processing and interpretation of a crustal seismic line and the application of AVO techniques.  
1984-1989 High school for building and land surveyor "Istituto tecnico per geometri - Max Fabiani", Trieste -Italy.

### Research experience

Currently, since September 2001

Istituto Nazionale di Oceanografia e Geofisica Sperimentale (OGS), Trieste – Italy. I've been involved in the following research projects:

*CO2 SiteChar - Characterization of European CO2 Storage*, funded by the European Commission under the Seventh Framework Programme.

*CO<sub>2</sub>Care – CO<sub>2</sub> site Closure Assessment and Research Verification*, funded by the European Commission under the Seventh Framework Programme.

*CO<sub>2</sub> Remove – Research, Monitoring, Verification*, EU-supported. Project Reference: 518350

*CASTOR – CO<sub>2</sub>, from capture to storage*, EU-supported. (Contract No. SES6-CT2004-502586).

*HYbrid Geophysical technology for the Evaluation of Insidious contaminated Areas – Hygeia*, EU-supported. (Contract No. EVK4-CT-2001-00046).

*Techniques for the Quantification of Methane Hydrate in European Continental Margins – Hydratech*, EU-supported. (Contract No. EVK3-CT-2000-00043).

2000 September – 2001 September

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Istituto Nazionale di Oceanografia e Geofisica Sperimentale (OGS),  
Trieste – Italy. Study of passive margins. Definition of their external  
limits by mean of geophysical and modeling techniques.

1999 August – 2000 August

University of Trieste – Italy.

Processing and interpretation of CROP (Italian Deep Crust  
Exploration Project) seismic profiles.

1999 January – July

Columbia University, Lamont-Doherty Earth Observatory New York -  
USA, Environmental and Engineering Group. Four-dimensional (4D)  
visualization and analysis of Ground Penetrating Radar data for the  
determination of three-dimensional hydrologic conductivity and time-  
dependent fluid flow.

### **Research interests**

Processing and interpretation of passive seismic data from hydraulic  
fracturing stimulation of reservoirs in anisotropic media.

Numerical modelling of seismic and electromagnetic wave propagation.

Rock physics, wave propagation in partially saturated media, study of the  
seismic properties of gas hydrate-bearing sediments, study of the  
electromagnetic properties of contaminated soils, study of the seismic  
properties of CO<sub>2</sub>-bearing sediments.

Seismic processing and interpretation.

### **Languages**

Italian-mother tongue

English-advanced

Spanish-elementary

### **Computer skills**

Operating system: Ms-dos, Windows, UNIX, linux, OSX.

Seismic processing software: Halliburton Galaxy, Promax (Landmark),

Focus (Paradigm), Seismic Unix.

Generic software: MSOffice, Corel Package, Adobe Creative Suite, HTML  
editors, Surfer, Uniras.

Programming languages: Fortran, HTML, C (beginner), Matlab.

### **Training courses**

2007 “Intel – SSG developer roadshow”. Software developing with  
multi-core processing architecture.

2007 English course “Council of Europe C1.2 level”, British School of  
Trieste.

2004 Course of “Debugging tools and optimization techniques for  
scalar and parallel codes.” - Cineca, Bologna.

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- 2003-2004 English course "Advanced English for Communicating - IX" – ARS Futura, Trieste.
- 2001 Course of Computer Graphics. Summer school of Computer Graphics, first edition – Cineca, Bologna.
- 2000 Introduction to GIS (Geographic Information System). University of Trieste – CSIA.
- 1997 Stage of Geological Survey Diving organised by the Universities of Cagliari and Trieste – Geosub Project.
- 1995-1997 Scuba Diving activities (Open Water Diver Licence and Advance Open Water Diver Licence).
- 1994-1997 Medium and Advanced Course of English Grammar and Conversation at the Popular University of Trieste.

### **Awards**

- 1998 *Petroleum Engineering and Geosciences University Theses Award* publicised by EAGE (European Association of Geoscientists & Engineering) and SPE (Society of Petroleum Engineers) Italian Section.

### **Papers**

- 2012 Picotti, S., Grünhut, V., Osella, A., Gei, D., Carcione, 2012, Sensitivity analysis of ERT to detect CO<sub>2</sub> leakages in the vicinity of an observation well at Ketzin storage site, submitted to The Leading Edge.
- 2012 Carcione, J. M., Gei, D., Picotti, S., and Michelini, A., 2012, *Cross-hole electromagnetic and seismic modeling for CO<sub>2</sub> detection and monitoring in a saline aquifer*, submitted to Journal of Petroleum Science and Engineering. (Accepted for publication)
- 2012 Picotti, S., Carcione, J. M., Gei, D., Rossi G., and Santos, J. E., 2012, *A seismic modeling methodology for monitoring CO<sub>2</sub> geological storage - The case of the Atzbach-Schwanenstadt gas field*, Journal of Geophysical Research, 117, B06103, doi:10.1029/2011JB008540
- 2012 Carcione, J. M., de laVega, M., Gei, D., Osella, A., Tassone, A., and Poscolieri, M., 2011, *Seismic characterization of the Quaternary sediments at Llançanelo-Lake Area*, Journal of Seismic Exploration, accepted for publication.
- 2011 Gei, D., Eisner, L., and Suhadolc, P., 2011, *Feasibility of estimating vertical transverse isotropy from microseismic data recorded by surface monitoring arrays*, Geophysics, 76 (6), WC117.
- 2011 Eisner, L., Zhang, Y., Gei, D., Duncan, P., Mueller, M.C. and Thornton, M. P., 2011, *Effective VTI anisotropy for consistent monitoring of microseismic events*, The Leading Edge, 30 (7), 772-776.
- 2010 Picotti, S., Carcione, J. M., Santos, J. E., and Gei, D., 2010, *Q-anisotropy in finely-layered media*, Geophysical Research Letters,

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- Vol. 37, L06302, 6 pp., doi:10.1029/2009GL042046.
- 2010 Carcione, J. M., Gei, D., and Treitel, S., 2010, *The velocity of energy through a dissipative medium*, Geophysics, 75, T37-T47.
- 2009 Carcione, J.M., and Gei, D., 2009, *Theory and numerical simulation of fluid-pressure diffusion in anisotropic porous media*, Geophysics, 74 (5), N31-N39.
- 2009 Rossi, G., Picotti, S., Gei, D., and Carcione, J., 2009, *Monitorare nel tempo la CO<sub>2</sub> in un sito di stoccaggio geologico: possibilità e limiti*, Geoitalia, Fist, N. 27, 9-13.
- 2009 Carcione, J. M., and Gei, D., 2009, *Simulation of ground motion and synthetic seismograms. The 1908 Messina Earthquake*, Environmental Semeiotics, 2(1), 1-15.
- 2008 Westbrook G.K., Chand S., Rossi G., Long C., Bünz S., Camerlenghi A., Carcione J.M., Dean S., Foucher J.-P., Flueh E., Gei D., Haacke R.R., Madrussani G., Mienert J., Minshull T.A., Nouzé N., Peacock S., Reston T.J., Vanneste M. and Zillmer M., 2008: *Estimation of gas-hydrate concentration from multi-component seismic data at sites on the continental margins of NW Svalbard and the Storegga region of Norway*. Marine and Petroleum Geology, **25**, 744-758.
- 2008 Rossi G., Gei D., Carcione J. and Picotti S., 2008: *CO<sub>2</sub> storage at the Aztzbach-Schwanenstadt gas field: a seismic monitoring feasibility study*. First Break, **26**, 45-51.
- 2007 Rossi G., Gei D., Böhm G., Carcione J. and Madrussani G., 2007: *Attenuation tomography: an application to gas-hydrate and free-gas detection*. Geophysical Prospecting, **55**, 655-669.
- 2006 Carcione J. M., Gei D., Botelho M. A. B., Osella A., and de la Vega M., 2006: *Fresnel reflection coefficients for GPR-AVO analysis and detection of seawater and NAPL contaminants*. Near Surface Geophysics, 4, 253-263.
- 2006 Carcione J.M., Picotti S., Gei D., Rossi G., 2006: *Physics and seismic modeling for monitoring CO<sub>2</sub> storage*. Pure and Applied Geophysics, **163**, 175-207.
- 2005 Carcione J.M., Gei D., Rossi G., Madrussani G., 2005: *Estimation of gas hydrate concentraion and free-gas saturation at the Norwegian-Svalbard continental margin*. Geophysical Prospecting, **53** (6), 803-810.
- 2004 Baradello L., Carcione J.M., Gei D., 2004: *Fast monostatic GPR modeling*. Geophysics, **69** (2), 466-471.
- 2004 Carcione J.M., Gei D., 2004: *Gas hydrate concentraion estimated from P- and S-wave velocities at the Mallik 2L-38 reseach well, Mackenzie Delta, Canada*. Journal of Applied Geophysics, **56**, 73-78.
- 2004 Carcione J.M., Poletto F., Gei D., 2004: *3-D wave simulation in anelastic media using the Kelvin-Voigt constitutive equation*. Journal of Computational Physics, **196**, 282-297.

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- 2004 Chand S., Minshull T., Gei D., Carcione J.M., 2004: *Elastic velocity models for gas-hydrate bearing sediments – a comparison*. Geophysical Journal International, 159 (2), 573-590. (doi:10.1111/j.1365-246X.2004.02387.x)
- 2003 Carcione J.M., Finetti I., Gei D., 2003: *Seismic-modeling study of the Earth's deep crust*. Geophysics, **68** (2), 656-664.
- 2003 Carcione J.M., Gei D., 2003: *Seismic modeling study of a subglacial lake*. Geophysical Prospecting, **51**, 501-515.
- 2003 Carcione J.M., Seriani G., Gei D., 2003: *Acoustic and electromagnetic properties of soils saturated with salt water and NAPL*. Journal of Applied Geophysics, **52**, 177-191.
- 2003 Gei D., Carcione J.M., 2003: *Acoustic properties of sediments saturated with gas hydrate, free gas and water*. Geophysical Prospecting, **51**, 141-157.

### **Books**

- 2009 Carcione J. M., Gei D., and Rossi G., 2009, Chapter on Wave theory, simulation and determination of gas-hydrate content in sediments, in Geophysical Characterization of Gas Hydrates, 349-371, ISBN: 978-1-56080-281-1
- 2007 Carcione J. M., and Gei D., 2007, Chapter 5 on "Métodos Sísmicos", in Arqueo-geofísica: Una aproximación interdisciplinaria para explorar el pasado, A. Osella and J. L. Lanata (ed.), Fundación de Historia Natural, Universidad Maimónides.
- 2006 Persoglia S., Carcione J.M., Rossi G., and Gei D., 2006: *4D seismics, gas-hydrates detection and overpressure prediction as a combined methodology for application to CO2 sequestration*. In: Advances in gas storage of Carbon Dioxide, eds. Lombardi S., Altunina L.K. and Beaubien S., NATO Science series, Springer publishing, 315-324, ISBN: 978-1-4020-4470-0.
- 2005 Carcione J.M., Finetti I., Gei D., 2005: *Seismic-modeling applied to interpretation of CROP crustal section in the Adriatic Sea*. CROP PROJECT: Deep Seismic Exploration of the Central Mediterranean and Italy, I. Finetti (ed.), Elsevier Science, 549-562.

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