

Curriculum vitae – Alberto Malinverno
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VITAL STATISTICS

Place of birth: Milano (Italy)

Nationality: USA and Italy

CONTACT INFORMATION

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EDUCATION

Laurea, Geological Sciences (cum laude), Università degli Studi di Milano, Italy, 1981.

Thesis title: Facies Acustiche Messiniane e Subsidenza del Mar Tirreno: Implicazioni Geodinamiche (Messinian Acoustic Facies and Subsidence of the Tyrrhenian Sea: Geodynamic Implications).

M. Ph., Geological Sciences, Columbia University, New York, 1986.

Ph. D., Geological Sciences, Columbia University, New York, 1989. Thesis title: Statistical Studies of Seafloor Geomorphology.

EMPLOYMENT HISTORY

1981-1982: Institute of Geology, Università degli Studi di Milano, Italy: Contract Researcher.

1982-1983: Italian Navy: Military service.

1984-1989: Lamont-Doherty Geological Observatory: Graduate Research Assistant.

1989-1990: Lamont-Doherty Geological Observatory: Post-Doctoral Research Scientist.

1990-1992: Lamont-Doherty Geological Observatory: Associate Research Scientist.

1992-1998: Schlumberger-Doll Research: Research Scientist.

1998-2005: Schlumberger-Doll Research: Principal Research Scientist (Program Manager since Jan. 2001).

2005-2014: Lamont-Doherty Earth Observatory: Senior Research Scientist.

2014-present: Lamont-Doherty Earth Observatory: Lamont Research Professor.

2006-2015: Dept. of Earth and Environmental Sciences, Columbia University, Lecturer.

2015-present: Dept. of Earth and Environmental Sciences, Columbia University, Adjunct Professor.

FELLOWSHIPS/PRIZES/HONORS

1984-1988: Graduate Research Assistantship, Columbia University.

1988: Bruce C. Heezen Memorial Prize, Lamont-Doherty Geological Observatory.

PROFESSIONAL SOCIETIES

American Geophysical Union
Società Geologica Italiana

EDITORSHIPS

1999-2005: Member of the editorial board of *Petroleum Geoscience*
2005-2010: Member of the editorial board of *Inverse Problems*
2010-present: Member of the advisory board of the *Italian Journal of Geosciences*

MARINE SURVEYS

Year	Ship	Activities	Location
1978	R/V EASTWARD	Transponder-navigated coring, dredging and photography, reflection seismics	Eastern and Western Mediterranean
1979	N/O SALERNUM	Coring and dredging	Eastern Mediterranean
1980	N/O BANNOCK	Coring and dredging	Eastern Mediterranean
1981	R/V PACIFIC SEAL	Sea MARC I side-looking sonar survey	U.S. East Coast continental slope
1981	N/O BANNOCK	Coring and dredging	Eastern Mediterranean
1984	R/V R. D. CONRAD	Sea MARC I side-looking sonar, SeaBeam, gravity and photographic survey	Eastern and Western Mediterranean
1984	HMCS ENDEAVOUR	Sea MARC I side-looking sonar and photographic survey	Juan de Fuca Ridge, NE Pacific Ocean
1985	CSS HUDSON	Sea MARC I side-looking sonar, magnetic and photographic survey	Kane Fracture Zone, Mid-Atlantic Ridge
1986	CSS TULLY	Sea MARC I side-looking sonar and photographic survey	Juan de Fuca Ridge, NE Pacific Ocean
1987	R/V LIBERTY STAR	Side-looking sonar survey	U.S. East Coast continental slope
1990	R/V MAURICE EWING	Side-looking sonar and Hydrosweep survey, reflection seismics	U.S. East Coast continental slope
1991	R/V MAURICE EWING	Hydrosweep, gravity and magnetic survey	East Pacific Rise 9°S
2005	JOIDES RESOLUTION	Drilling, coring, logging-while-drilling, wireline logging	IODP Exp. 311, Cascadia margin
2006	JOIDES RESOLUTION	Logging-while-drilling	NGHP-1, eastern India continental margin
2009	JOIDES RESOLUTION	Drilling, coring, wireline logging	IODP Exp. 321, Equatorial Pacific
2011	JOIDES RESOLUTION	Drilling, coring, logging-while-drilling	IODP Exp. 334, Costa Rica margin
2012	JOIDES RESOLUTION	Drilling, coring, wireline logging	IODP Exp. 344, Costa Rica margin

TEACHING EXPERIENCE – COLUMBIA UNIVERSITY COURSES

Organized and taught G9947, Marine Geophysics Seminar, Fractals (Fall 1990)

Co-organized with Dave Goldberg EESC G9947, Marine Geophysics Seminar, Well Logging Principles and Applications (Spring 2008) and taught 3 lectures (on sediment physical properties, borehole logging, quantifying gas hydrates and cyclostratigraphy).

Gave 2-3 lectures (on sediment physical properties, well logging, and methane gas hydrates in sediments) in W4937, Ocean Sedimentation and Stratigraphy (Spring 2005 and Spring 2007) and W4937, Cenozoic Paleooceanography (Spring 2008).

Team-taught EESC G6300, Geophysical inverse theory, giving ten lectures on Bayesian methods for geophysical inversion (Spring 2006).

Team-taught EESC V2200, The Solid Earth System with Bill Menke (Fall 2006-2007) and with Maya Tolstoy (Fall 2009-2014).

Taught EESC G6908, Quantitative Methods of Data Analysis (Fall 2015).

SHORT COURSES

Lectured in four short courses on fractal geometry and its application to Earth sciences and the petroleum industry (with C.C. Barton and P.R. LaPointe):

- April 11 1991, Annual Meeting of the American Association of Petroleum Geologists, Dallas.
- October 19-20 1991, Annual Meeting of the Geological Society of America, San Diego.
- March 11-13 1992, Schools of the American Association of Petroleum Geologists, Houston.
- October 29-30 1993, Annual Meeting of the Geological Society of America, Boston.

Lectured in a two-day short course “Introduction to Geostatistics,” November 13-14 1995, PEMEX, Ciudad del Carmen, Mexico.

Co-organized and gave two lectures in a summer school on “Mathematical Geophysics and Uncertainty in Earth Models,” June 14-25 2004, Colorado School of Mines, Golden, Colorado (Organizing committee: R. Snieder, L. Tenorio, E. Haber, A. Malinverno, and M. Ritzwoller).

Co-organized and gave a lecture in a summer school on the recent tectonics of the Calabrian Arc, September 1-12 2008, University of Calabria, Arcavacata (Cosenza), Italy (Organizing committee: A. Malinverno, I. Guerra, N. D’Agostino, T. Dewez, M. Steckler, C. Stark, and L. Seeber). The school was part of a NSF-supported Calabrian Arc project; see <http://www.calabarco.org/education>.

Organized and taught a one-week short course (nine lectures) “Gas hydrates: the present and the past” at the Dept. of Earth Sciences, University of Milano, Italy (October 6-10 2008 and November 7-11 2011).

Co-organized and gave six lectures (on borehole logging, stress measurements, and methane hydrates) in a training course on borehole geophysical measurements at the Istituto Nazionale di Oceanografia e di Geofisica Sperimentale (OGS), Trieste, Italy (Nov. 11-13 2015).

REFEREED PUBLICATIONS

1. Cita, M. B., F. Benelli, B. Bigioggero, H. Chezar, A. Colombo, N. Fantini Sestini, R. Freeman-Lynde, S. Iaccarino, F. Jadoul, E. Legnani, A. Malinverno, P. Massiotta, L. Paggi, and I. Premoli Silva, Contribution to the geological exploration of the Malta escarpment (eastern Mediterranean), *Riv. Ital. Paleont.*, 86, 317-356, 1980.
2. Malinverno, A., Quantitative estimates of age and Messinian paleobathymetry of the Tyrrhenian Sea after seismic reflection, heat flow and geophysical models, *Boll. Geofis. Teor. Appl.*, 23, 159-171, 1981.
3. Malinverno, A., M. Cafiero, W. B. F. Ryan, and M. B. Cita, Distribution of Messinian sediments and erosional surfaces beneath the Tyrrhenian Sea: geodynamic implications, *Oceanol. Acta*, 4, 489-496, 1981.
4. Cita, M. B., C. Broglia, A. Malinverno, G. Spezzi Bottiani, L. Tomadin, and D. Violanti, Late Quaternary pelagic sedimentation on the southern Calabrian Ridge and western Mediterranean Ridge, eastern Mediterranean, *Mar. Micropaleontol.*, 7, 135-162, 1982.
5. Cita, M. B., F. Benelli, B. Bigioggero, A. Bossio, C. Broglia, H. Chezar, G. Clauzon, A. Colombo, M. Giambastiani, A. Malinverno, E. L. Miller, E. Parisi, G. Salvatorini, and P. Vercesi, Unusual debris flow deposits from the base of the Malta escarpment (eastern Mediterranean), in *Marine slides and other mass movements*, edited by S. Saxov and J. K. Nieuwenhuis, p. 305-322, Plenum Publishing Co., New York, 1982.
6. Cita, M.B., Bossio, A., Colombo, A., Gnaccolini, M., Salvatorini, G., Broglia, C., Camerlenghi, A., Catrullo, D., Clauzon, G., Croce, M., Giambastiani, M., Kastens, K.B., Malinverno, A., McCoy, F.W., Parisi, E. Sedimentation in the Mediterranean Ridge cleft (DSDP Site 126). *Mem. Soc. Geol. It.* 24, 427-442, 1982.
7. Alonso, B., K. A. Kastens, A. Maldonado, A. Malinverno, C. H. Nelson, S. O' Connell, A. Palanques, and W. B. F. Ryan, Morphology of the Ebro Fan Valleys from SeaMARC and Sea Beam profiles, *Geo-Marine Letters*, 5, 141-148, 1985.
8. O' Connell, S., B. Alonso, K. A. Kastens, A. Maldonado, A. Malinverno, C. H. Nelson, A. Palanques, and W. B. F. Ryan, Morphology and downslope sediment displacement in a deep-sea valley, the Valencia valley (northwestern Mediterranean), *Geo-Marine Letters*, 5, 149-156, 1985.
9. Malinverno, A., and W. B. F. Ryan, Extension in the Tyrrhenian Sea and shortening in the Apennines as result of arc migration driven by sinking of the lithosphere, *Tectonics*, 5, 227-245, 1986.
10. Gilbert, L. E., and A. Malinverno, A characterization of the spectral density of residual ocean floor topography, *Geophys. Res. Letters*, 15, 1401-1404, 1988.
11. Malinverno, A., W. B. F. Ryan, G. A. Auffret, and G. Pautot, Sonar images of the path of failure events on the continental margin off Nice, France, *Geol. Soc. Amer. Spec. Paper*, 229, 59-75, 1988.
12. Malinverno, A., Testing linear models of seafloor topography, *Pure Appl. Geophys.*, 319, 139-155, 1989.
13. Malinverno, A., Segmentation of topographic profiles of the sea floor based on a self-affine model, *IEEE J. Oceanic Eng.*, 14, 348-359, 1989.
14. Malinverno, A., and L. E. Gilbert, A stochastic model for the creation of abyssal hill topography at a slow spreading center, *J. Geophys. Res.*, 94, 1665-1675, 1989.
15. Malinverno, A., A quantitative study of the axial topography of the Mid-Atlantic Ridge, *J. Geophys. Res.*, 95, 2645-2660, 1990.

16. Malinverno, A., A simple method to estimate the fractal dimension of a self-affine series, *Geophys. Res. Letters*, 17, 1953-1956, 1990.
17. Malinverno, A., M. H. Edwards, and W. B. F. Ryan, Processing of Sea MARC swath sonar data, *IEEE J. Oceanic Eng.*, 15, 14-23, 1990.
18. Malinverno, A., and R. A. Pockalny, Abyssal hill topography as an indicator of episodicity in crustal accretion, *Earth Planet. Sci. Lett.*, 99, 154-169, 1990.
19. Malinverno, A., Reply to a comment on "A quantitative study of the axial topography of the Mid-Atlantic Ridge", *J. Geophys. Res.*, 96, 2049-2056, 1991.
20. Malinverno, A., Inverse square-root dependence of mid-ocean-ridge flank roughness on spreading rate, *Nature*, 352, 58-60, 1991.
21. Edwards, M. H., D. J. Fornari, J. A. Madsen, A. Malinverno, and W. B. F. Ryan, The regional tectonic fabric of the East Pacific Rise from 12°50'N to 15°10'N, *J. Geophys. Res.*, 96, 7995-8017, 1991.
22. Hiscott, R. N., A. Colella, P. Pezard, M. A. Lovell, and A. Malinverno, Sedimentology of deep-water volcanoclastics, Oligocene Izu-Bonin forearc basin, based on Formation MicroScanner images, *Proc. ODP, Sci. Results*, 126, 75-96, 1992.
23. Pezard, P., R. N. Hiscott, M. A. Lovell, A. Colella, and A. Malinverno, Evolution of the Izu-Bonin intraoceanic forearc basin, western Pacific, from cores and FMS images, in *Geological Applications of Wireline Logs II*, Geological Society Special Publication 65, edited by A. Hurst, C. M. Griffiths, and P. F. Worthington, pp. 43-69, Geological Society, London, 1992.
24. Cochran, J. R., J. A. Goff, A. Malinverno, D. J. Fornari, C. Keeley, and X. Wang, Morphology of a "superfast" mid-ocean ridge crest and flanks: the East Pacific Rise, 7°-9°S, *Mar. Geophys. Res.*, 15, 65-75, 1993.
25. Cowie, P. A., C. H. Scholz, A. Malinverno, and M. H. Edwards, Fault strain and seismic coupling on mid-ocean ridges, *J. Geophys. Res.*, 98, 17911-17920, 1993.
26. Goff, J. A., D. J. Fornari, J. R. Cochran, C. Keeley, and A. Malinverno, The Wilkes transform system and "nannoplate", *Geology*, 21, 623-626, 1993.
27. Goff, J. A., A. Malinverno, D. J. Fornari, and J. R. Cochran, Abyssal hill segmentation: Quantitative analysis of the East Pacific Rise flanks 7°S-9°S, *J. Geophys. Res.*, 98, 13851-13862, 1993.
28. Hiscott, R. N., A. Colella, P. Pezard, M. A. Lovell, and A. Malinverno, Basin plain turbidite succession of the Oligocene Izu-Bonin intraoceanic forearc basin, *Mar. Petr. Geol.*, 10, 450-466, 1993.
29. Malinverno, A., Transition between a valley and a high at the axis of mid-ocean ridges, *Geology*, 21, 639-642, 1993.
30. Malinverno, A., and P. A. Cowie, Normal faulting and the topographic roughness of mid-ocean ridge flanks, *J. Geophys. Res.*, 98, 17921-17939, 1993.
31. Cowie, P. A., A. Malinverno, W. B. F. Ryan, and M. H. Edwards, Quantitative fault studies on the East Pacific Rise: A comparison of sonar imaging techniques, *J. Geophys. Res.*, 99, 15205-15218, 1994.
32. Malinverno, A., and D. J. Rossi, The method of Projection onto Convex Sets for the reconstruction of subsurface property maps, in *Geostatistics for the Next Century*, edited by R. Dimitrakopoulos and A. Journel, 197-208, Kluwer Academic Publishers, Dordrecht, The Netherlands, 1994.
33. Weissel, J. K., L. F. Pratson, and A. Malinverno, The length-scaling properties of topography, *J. Geophys. Res.*, 99, 13,997-14,012, 1994.
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35. Malinverno, A., Fractals and ocean floor topography: A review and a model, in *Fractals in the Earth Sciences*, edited by C. C. Barton and P. R. LaPointe, Plenum, New York, 107-130, 1995.

36. Weissel, J. K., A. Malinverno, D. G. Harding, and G. D. Karner, Erosion dynamics and patterns on the Ethiopian Plateau of northeast Africa: A fractal process, in *Fractals in Petroleum Geology and Earth Processes*, edited by C. C. Barton and P. R. LaPointe, Plenum, New York, 127-142, 1995.
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38. Malinverno, A., A Bayesian criterion for simplicity in inverse problem parametrization, *Geophys. J. Int.*, 140, 267-285, 2000.
39. Malinverno, A., and C. Torres-Verdin, Bayesian inversion of DC electrical measurements with uncertainties for reservoir monitoring, *Inverse Problems*, 16, 1343-1356, 2000.
40. Torres-Verdin, C., V. Druskin, S. Fang, L. Knizhnerman, and A. Malinverno, A dual-grid nonlinear inversion technique with application to the interpretation of DC resistivity data, *Geophysics*, 65, 1733-1745, 2000.
41. Malinverno, A., Parsimonious Bayesian Markov chain Monte Carlo inversion in a nonlinear geophysical problem, *Geophys. J. Int.*, 151, 675-688, 2002.
42. Malinverno, A., and Briggs, V. A., Expanded uncertainty quantification in inverse problems: Hierarchical Bayes and empirical Bayes, *Geophysics*, 69, 1005-1016, 2004.
43. Bennett, N., and Malinverno, A., Fast model updates using wavelets, *Multiscale Modeling and Simulation*, 3, 106-130, 2004.
44. Malinverno, A., and Leaney, W. S., Monte Carlo Look-Ahead Inversion of Walkaway Vertical Seismic Profiles, *Geophys. Prospecting*, 53, 689-703, 2005.
45. Malinverno, A., and Parker, R. L., Two ways to quantify uncertainty in geophysical inverse problems, *Geophysics*, 71, W15-W27, 2006.
46. Riedel, M., T. Collett, M. Malone, F. Akiba, M. Blanc-Valleron, M. Ellis, G. Guerin, Y. Hashimoto, V. Heuer, Y. Higashi, M. Holland, P. Jackson, M. Kaneko, M. Kastner, J.-H. Kim, H. Kitajima, P. Long, A. Malinverno, G. Myers, L. Palekar, J. Pohlman, P. Schultheiss, B. Teichert, M. Torres, A. Tréhu, J. Wang, U. Wortmann, and H. Yoshioka, Gas Hydrate Transect Across Northern Cascadia Margin, *Eos, Trans. AGU*, 87(33), 325-332, 2006.
47. Riedel, M., T. S. Collett, M. J. Malone, and IODP Exp. 311 Scientists (including A. Malinverno), Stages of Gas-Hydrate Evolution on the Northern Cascadia Margin, *Scientific Drilling*, 3, Sept. 2006, doi:10.2204/iodp.sd.3.04.2006.
48. Nagel T. J., W. B. F. Ryan, A. Malinverno, W. R. Buck, Pacific trench motions controlled by the asymmetric plate configuration, *Tectonics*, 27, TC3005, doi:10.1029/2007TC002183, 2008.
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50. Malinverno, A., M. Kastner, M. E. Torres, and U. G. Wortmann, Gas Hydrate Occurrence From Pore Water Chlorinity and Downhole Logs in a Transect Across the Northern Cascadia Margin (IODP Exp. 311), *J. Geophys. Res.*, 113, B08103, doi:10.1029/2008JB005702, 2008.
51. Stroup, D. F., M. Tolstoy, T. J. Crone, A. Malinverno, D. R. Bohnenstiehl, and F. Waldhauser, Systematic along-axis tidal triggering of microearthquakes observed at 9°50'N East Pacific Rise, *Geophys. Res. Lett.*, 36, L18302, doi:10.1029/2009GL039493, 2009.
52. Malinverno, A., Marine gas hydrates in thin sands that soak up microbial methane, *Earth Planet. Sci. Lett.*, 292, 399-408, doi:10.1016/j.epsl.2010.02.008, 2010.
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54. Piana Agostinetti, N. and Malinverno, A., Receiver function inversion by trans-dimensional Monte Carlo sampling, *Geophys. J. Int.*, 181, 858-872, doi:10.1111/j.1365-246X.2010.04530.x, 2010.

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58. Malinverno, A. and Pohlman, J. W., Modeling sulfate reduction in methane hydrate-bearing continental margin sediments: Does a sulfate-methane transition require anaerobic oxidation of methane? *Geochem. Geophys. Geosyst.*, 12, Q07006, doi:10.1029/2011GC003501, 2011.
59. Malinverno, A., J. Hildebrandt, M. Tominaga, and J. E. T. Channell, M-sequence geomagnetic polarity time scale (MHTC12) that steadies global spreading rates and incorporates astrochronology constraints, *J. Geophys. Res.*, 117, B06104, doi:10.1029/2012JB009260, 2012.
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61. Anders, M. H., N. Christie-Blick, and A. Malinverno, Cominco American well: Implications for the reconstruction of the Sevier Orogen and Basin and Range extension in west-central Utah, *Am. J. Sci.*, 312, 508-533, doi:10.2475/05.2012.02, 2012.
62. Malinverno, A., Data report: Monte Carlo correlation of sediment records from core and downhole log measurements at Sites U1337 and U1338 (IODP Expedition 321), in Pälike, H., Lyle, M., Nishi, H., Raffi, I., Gamage, K., Klaus, A., and Expedition 320/321 Scientists, *Proceedings IODP, Exp. 320/321*: Tokyo, Integrated Ocean Drilling Program Management International, Inc., doi:10.2204/iodp.proc.320321.207.2013, 2013.
63. Cook, A. E., and Malinverno, A., Short migration of methane into a gas hydrate-bearing sand layer at Walker Ridge, Gulf of Mexico, *Geochem. Geophys. Geosyst.*, 14, 283-291, doi:10.1002/ggge.20040, 2013.
64. Vannucchi, P., Ujiie, K., Stroncik, N. and the IODP Exp. 334 Scientific Party (including A. Malinverno), IODP Expedition 334: An investigation of the sedimentary record, fluid flow and state of stress on top of the seismogenic zone of an erosive subduction margin, *Scientific Drilling*, 15, March 2013, 23-30, doi:10.2204/iodp.sd.15.03.2013.
65. Cook, A. E., Goldberg, D., and Malinverno, A., Natural gas hydrates occupying fractures: a focus on non-vent sites on the Indian continental margin and the Gulf of Mexico, *J. Mar. Petr. Geol.*, 58, 278-291, doi:10.1016/j.marpetgeo.2014.04.013, 2014.
66. Erba E., Duncan R.A., Bottini C., Tiraboschi D., Weissert H., Jenkyns H.C., and Malinverno, A., Environmental consequences of Ontong Java Plateau and Kerguelen Plateau volcanism, in *The Origin, Evolution, and Environmental Impact of Oceanic Large Igneous Provinces*, edited by C. R. Neal, W. W. Sager, T. Sano and E. Erba, Geological Society of America Special Paper 511, doi:10.1130/2015.2511(15), 2015.
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