

## Curriculum Vitae



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Nationality Italian

Birth day 23<sup>rd</sup> April 1971

**Occupation** Associate Professor of Sedimentology and Sedimentary Petrography at the Department of Earth and Environmental Sciences of Milano-Bicocca, Milan, Italy. In charge of the "Laboratory of Provenance studies, Heavy Minerals and Raman Spectroscopy studies"

### Education

Doctor of Philosophy 22/01/2008

University of Milano Bicocca - Piazza dell'Ateneo Nuovo, 1 – MILANO, Italy

Title Heavy Minerals: Provenance, Hydraulic Sorting, Weathering

### Research interest

The state of the art in provenance studies shows that this technique is still far to be developed in his full potential. Full integration between bulk-composition and heavy-minerals analyses may allow a further substantial development of this field of research. It's important to develop innovative analytical techniques for the investigation of detrital systems, such as in heavy-mineral analyses and micro-Raman spectroscopy. I'm involved in several projects regarding modern sand and silt and the study of major big rivers: in the Alps (Po River); Caucasus, Himalaya (Indus, Ganga and Brahmaputra), Africa (Orange River, Limpopo River, Congo River and the Nile River system) and Indus and Bengal Fan turbidites. The analysis of detritus of different grain size sheds light on physical laws which control the distribution of detrital grains according to their size, density and shape. This is a fundamental pre-requisite to correctly calculate sediment fluxes and thus to reconstruct erosion patterns along mountain ranges, on the basis not only of detrital geochronology data, but also of bulk-composition data and heavy-mineral assemblages. Results of petrographic-mineralogical analyses is combined to provide an independent mean to assess erosion rates with greatly increased precision, and thus accurately check estimates obtained with different analytical methods. Micro-Raman analyses is useful to improve the characterization of grains. Micro-Raman studies integrate microscope compositional analyses of detritus, and allow us to better analyze very fine sands and silt fraction, representing most of the erosional products in orogenic settings. The analytical appliances required for our study are already available at the Department of Earth and Environmental Sciences of Milano-Bicocca (Gemini shaking table, Frantz isodynamic magnetic separator, centrifuges and heavy liquids). Instruments in the Department Labs allow advanced sieving and petrographic analyses (e.g. laser granulometer, petrographic microscopes with point counters and digital camera). Dense minerals are concentrated with Sodium-politatumgstate, and 200 to 250 transparent dense minerals are counted by the "ribbon-counting", "Fleet" methods (Mange and Maurer, 1992) or Point counting. Numerical results are interpreted by using software packages for multivariate statistical analysis (Principal Components Analysis technique). We focus our attention on modern sand and silt, the actualistic approach provides an invaluable help to integrate classic microscope analyses of heavy mineral assemblages and the innovative Raman spectrometry analyses. The Raman technique is a totally innovative tool in provenance studies. Our aim is to develop an automated procedure for the analysis of sediments, in order to get a large amount of compositional parameters in a relatively short time. This procedure will be calibrated for most of the minerals derived from different source rocks. After calibration, micro-Raman analyses is performed routinely on silt and sand-size samples in our laboratory (Renishaw inVia, laser 532 nm).

### ***Organization and participation as relator during international scientific meeting outside Italy:***

- Convener in session 16f entitled: "Quantitative Provenance Studies of Clastic Sedimentary Rocks", 25° Goldschmidt Conference, 2015, in Praga, Repubblica Ceca, from 17-08-2015 to 21-08-2015
- Convener in session OS51B, entitled: " The Contribution of Ocean Drilling to Understanding the Cenozoic Tectonics and Climate History of the Indian Ocean and Environs II Posters", at AGU 2017, New Orleans, USA, from 15-12-2017 to 15-12-2017
- Convener in session OS54B, entitled: "The Contribution of Ocean Drilling to Understanding the Cenozoic Tectonics and Climate History of the Indian Ocean and Environs I", AGU 2017, New Orleans, USA, from 15-12-2017 to 15-12-2017
- Convener in session SSP3.2/GM11.8, entitled: "Understanding of marine records and sedimentary processes: From continental environments to the deep-sea ", EGU 2018, Vienna, Austria, from 09-04-2018 to 09-04-2018

### ***Management or participation in the activities of a research group considered by collaborations at national or international level***

- Participation to a proposal for a NSF project entitled: "Climate tectonic interactions since the late Miocene: integrated records from the Arabian Sea", Louisiana State University, Baton Rouge, USA (Professor Peter Clift), from 18-01-2017 and in progress.
- Participation as member of Scientific commitments of the WGS (Working Group on Sediment Generation), from 31-01-2017 and in progress.
- Participation to PRIN 2015: "The subduction and exhumation of the continental lithosphere: their effects on the structure and evolution of the orogens", n°2015EC9PJ5\_003, ERC PE10, Scientific Coordinator, Carlo Doglioni, from 05-02-2017 and in progress.
- Participation as invited speaker for the discussion of preliminary results of recent IODP expeditions, during the workshop entitled: "Land-Ocean Interactions Across the Indian Ocean: Toward Regional Integration of Recent Drilling Results", in Narragansett, RI, USA, from 10-07-2017 to 12-07-2017

### ***Responsibility for scientific studies and research entrusted by qualified public institutions or Private***

- Responsible for studies and research related to the international project RAiN (Regional Archives for Integrated iNvestigations) of MARUM (Center for marine environmental sciences di Bremea, Germany), from 25-09-2015 to 30-09-2015
- Scientific manager for researches dealing on "Mineralogy of chalk" for the University of Stavanger, Department for Petroleum Engineering, Norway, from 02-11-2016 to 01-12-2016
- Scientific responsible for a study entitled: "Source tracking heavy minerals and zircons provenance", per Total E&P Recherche Developpement, Ref. 00009048, from 01-01-2017 and in progress.
- Scientific manager for researches dealing on "Mineralogical analyses of sediments" for Hafren Scientific LTD, United Kingdom, from 07-03-2017 to 06-04-2017
- Scientific manager for researches dealing on "Mineralogical analyses" for Hafren Scientific LTD, United Kingdom, from 09-05-2017 to 08-06-2017
- Scientific manager for researches dealing on " Mineralogical analyses of sediments " for IFREMER, Unite Geosciences Marines Laboratoire Geodynamique et Enregistrements Sedimentaires, Plouzane, France, from 15-09-2017 to 14-10-2017

### ***Scientific responsibility for international and national research projects, admitted to financing on the basis of competitive calls for peer review***

- Scientific responsibility for research agreement within the project ECORD (European Consortium for Ocean Research Drilling) and IODP (International Ocean Discovery Program) and Università di Milano-Bicocca (DISAT). CUP H42F16000960001, from 21-09-2016 and in progress.
- Scientific responsibility of the project GeoArgNet "Geowissenschaftliches Kooperationsprojekt zwischen Deutschland und Argentinien" between Germany and Argentina as external partner - GFZ Project Bureau Helmholtz-Zentrum di Potsdam, from 03-07-2017 and in progress

### ***Direction or participation in editorial committees of magazines, editorial series of recognized prestige***

- Participation in the editorial committee for: "Postcruise (editorial) meeting of International Ocean Discovery Program, JOIDES Resolution Science Operation (IODP-JRSO), Expedition 355 (Arabian Sea Monsoon)", College Station, Texas, USA, from 16-11-2015 to 20-11-2015
- Editor for the Journal Minerals (ISSN 2075-163X), of the special volume entitled "Handbook of Heavy Minerals" from 22-12-2017 and in progress

### ***Participation in the college of teachers or assignment of teaching assignments, as part of research doctorates accredited by the Ministry***

- Co-Supervisor PhD 2014, in Earth Sciences entitled: "Heavy minerals: a key tool to unravel orogenic processes. Sediment generation and recycling at convergent plate boundaries (Indo-Burman-Andaman-Nicobar and Barbados Ridges)". Supervisor Eduardo Garzanti, candidate Mara Limonta. Department of Earth and Environmental Sciences, University of Milano-Bicocca, Milan, Italy, from 01-01-2011 to 22-01-2014
- Co-Supervisor PhD, 2018, entitled: "Raman Spectroscopy applied to the mineralogical analysis of chalk". Supervisor Udo Zimmermann, candidate Laura Borromeo. Faculty of Sciences and Technology, Department of Energy Resources, University of Stavanger, Norway, from 01-09-2014 and in progress
- Supervisor PhD, in Earth Sciences entitled: "Paleoclimatic reconstructions from ice cores: mineralogical and provenance study of Antarctic and Arctic eolian dust using Raman spectroscopy". Co-Supervisor Barbara Delmonte, candidate Chiara Ileana Paleari. Department of Earth and Environmental Sciences, University of Milano-Bicocca, Milan, Italy, from 01-11-2017 and in progress

### ***Formal assignment of teaching or research assignments (fellowship) at qualified universities and foreign or supranational research institutes***

- Lecturer of the course "Heavy Minerals - a key tool in sediment provenance studies", during the 31<sup>st</sup> IAS Meeting of Sedimentology, in Krakow, Polonia, from 21-06-2015 to 22-06-2015
- Lecturer per il corso " Analysis of heavy minerals and their application in Sedimentary Geology", at Geozentrum Nordbayern at Friedrich Alexander University (FAU), Erlangen-Nuremberg, Germany, from 22-01-2018 to 22-01-2018

### ***Achievement of prizes and awards for scientific activity of recognized prestige in the sector***

- Achievement of prize FFABR 2017, for the annual individual financing of the activities research base referred to ART. 1, COMMI 295 E SEGUENTI, DELLA LEGGE 11 DICEMBRE 2016 N. 232 (GU n.297 del 21-12-2016 - Suppl. Ordinario n. 57, from 16-06-2017 to 10-07-2017

### ***Specific professional experiences***

- Research activity for sediment analysis of cuttings for Chevron and HM Research Associate, West Midlands UK, from 27-02-2013 to 26-03-2013
- Participation in the oceanographic expedition as sedimentologist on board with the vessel Joides Resolution, Exp. IODP-355, from Colombo (Sri Lanka) to Mumbai (India), from 31-03-2015 to 31-05-2015
- Participation to the sampling of sediments from cores for the "IODP Expedition 355 (Arabian Sea Monsoon) Sampling Meeting", at IODP Gulf Coast Repository in College, Station, TX, USA, from 24-08-2015 to 28-08-2015
- Participation as "guest research" at MARUM (Center for marine environmental sciences) for the project RAIN (Regional Archives for Integrated iNvestigations), Bremen Germany, from 25-09-2015 to 30-09-2015
- Participation in the oceanographic expedition as sedimentologist on board with the vessel Meteor, expedition M123, from Walvis Bay (Namibia) to Maputo Bay (Mozambique) and port in Cape Town (South Africa), from 01-02-2016 to 27-02-2016
- Research activity for sediment analysis of sediments for the State Key Laboratory of Mineral Deposit Research, Nanjing University, China (Xiumian Hu), from 06-11-2016 to 21-11-2016
- Research activity for sediment analysis of sediments for the Lancaster Environment Center, UK (Yani Najman). from 06-11-2016 to 21-11-2016
- Research activity for sediment analysis of sediments for the Institute of Archeology , University College of London, UK (Altaweel Mark), from 15-06-2017 to 25-06-2017

- Organization and management of the International School for the study and recognition of heavy minerals entitled: "2nd Heavy Mineral School", at Dipartimento di Scienze dell'Ambiente e della Terra di Milano-Bicocca, Italia, from 20-02-2018 to 23-02-2018

***Reviewer for international Journals in the period 2008 - 2018:***

- Spectrochimica Acta Part A: Molecular and Biomolecular
- Geological Society of America
- Sedimentary Geology
- Journal of Raman Spectroscopy
- Geological Journal
- International Journal of Earth Sciences
- Journal of Coastal Research
- Basin Research
- Journal of Asian Earth Sciences
- Geological Magazine
- Geosphere
- Journal of Geochemical Exploration
- International Geology Review
- Journal of the Geological Society

Milan  
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