

Catherine NOIRIEL

April 28, 1978

French nationality

Adress Géosciences Environnement Toulouse - Université Paul Sabatier
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EXPERIENCE

- Since 2011** **Assistant Professor**, Department of Earth and Environmental Sciences (University of Toulouse, France) - Teaching thermodynamics and geochemistry
- Spring 2010** **Guest Researcher**, Lawrence Berkeley Lab (Berkeley, CA) & Centre for Nanoscale Control of Geologic CO₂ (EFRC) - Growth of calcite in porous media
- 2006-2011** **Assistant Professor**, Department of Geological Sciences (University of Lille, France) - Teaching earth sciences and applied geology
- 2006** **Post-doctoral research associate**, Laboratory of Geophysics and Tectonophysics (University of Grenoble, France) - ANR Géocarbon - carbonatation national project (CO₂ sequestration in reservoirs) - Crystallisation pressure study in porous rocks
- 2002-2004** **Graduate student research assistant**, Laboratory of Tectonophysics (University of Montpellier, France) - Participation to FSH/CEP&M PICOR national project (CO₂ sequestration in reservoirs) - Experimental characterisation of the porosity-permeability relationship from geometry modification in fractured and porous rock samples

RESEARCH THEMES

- Water chemistry, mineral reactivity, CO₂ sequestration in deep reservoirs
- Coupled flow, transport and chemical process in porous and fractured rocks: laboratory experiments and reactive transport modelling
- X-ray microtomography: acquisition, image processing, 3D characterisation. Experience of image acquisition at several synchrotron beamlines (ESRF, SLS, ALS) and lab sources (habilitated operator of the GE nanotom of Federation Fermat, Toulouse)

EDUCATION

- 2019** **Habilitation à Diriger des Recherches**
University Paul Sabatier Toulouse
Title: From mineral reactivity to hydro-mechano-chemical coupling processes: contribution of X-ray micro-tomography to monitoring in space time
- 2001-2005** **PhD in quantitative hydrogeology, geochemistry and rock physics**
Ecole des Mines de Paris & University of Montpellier, France
Title: Experimental study and modelling of the relationship between the fluid geochemistry and the modifications of geometry and flow in fractured sedimentary rocks. *Supervisors:* Benoît Madé and Philippe Gouze
- 2001** **Master in hydrology, geochemistry and geostatistics**
University Pierre & Marie Curie, Paris VI, France

PROFESSIONAL ACTIVITIES

- Head of the Bachelor's degree of Earth Sciences at the University Paul Sabatier, Toulouse. Head of the 3rd year Bachelor's redirecting program toward Earth Sciences and Environment (2016-2020)
- Co-convener of the session 08b: Spatial and Temporal Dynamics of Early Stages of Mineral Formation and Micron-scale Heterogeneities – Insights from Field, Experiments and Numerical Approaches at the Goldschmidt conference, Paris, 2017 (with Dorothee Hippler, Eva De Boever, Anneleen Foubert, Linda Luquot, Catherine Noiriél, Maria Garcia Rios, Alexander van Driessche, Matthias Kellermeier, José Manuel Delgado-López and Denis Gebauer).
- Local committee member for the 5th International Workshop on CRYStallisation in POrous Media (CRYSPOM) held in Toulouse, 2016 June 6-8. The workshop is organized for bringing together researchers from physics, chemistry, mechanics, geosciences and conservation interested in salt nucleation, growth and transport in porous media and the related consequences.
- Co-convener of the session 10e: Role of the Pore-Scale Heterogeneities on Reactive Transport Processes: Experimental and Numerical Approaches (with L. Luquot et M. Garcia-Rios) at the Goldschmidt, Yokohama, 2016
- Guest Editor with P. Bénézech and B. Ménéz (Editor in Chief: Jeremy Fein) of the special issue of Chemical Geology on CO₂ geological storage (vol. 265, 2009). Edition of 21 manuscripts.
- Co-convener with P. Bénézech and B. Ménéz of the EGU session: GMPV11 Geochemistry, Mineralogy, Petrology and Volcanology - CO₂ Geological Sequestration: bio-mechano-geochemical processes from the pore-scale to the reservoir-scale. Vienna, Austria, 2007

PUBLICATIONS

Poirier M., Blotevogel S., **Noiriél C.**, Bonnin A., Kaknics J., Olbinado M., Steger L., Patapy C., and Cyr M. (2022) Synchrotron X-ray micro-tomography investigation of the early hydration of blended cements: a case study on CaCl₂-accelerated slag-based blended cements. Construction and Building Materials, vol 321, 126412, doi 10.1016/j.conbuildmat.2022.126412

Noiriél C. and Soulaire C. (2021) Pore-scale imaging and modelling of reactive flow in evolving porous media: tracking the dynamics of the fluid-rock interface. Transport in Porous Media, Special issue 35th Anniversary special issue in honour of Jacob Bear, vol. 140 (1), 201-213, doi 10.1007/s11242-021-01613-2

Noiriél C., Seigneur N., Le Guern P., and Lagneau V. (2021) Geometry and mineral heterogeneity controls on calcite precipitation in fractures: an X-ray micro-tomography and reactive transport modeling study. Advances in Water Resources, vol. 121, article 103916, doi 10.1016/j.advwatres.2021.103916

d'Abzac F.X (†), **Noiriél C.**, Marquet A., and Brichau S. (2020) Comparison of 1030 nm and 257 nm wavelengths for U-Pb zircon dating by femtosecond laser ablation – Inductively coupled plasma mass spectrometry with support of 3D crater imaging. Spectrochimica Acta Part B: Atomic Spectroscopy, vol. 138, doi 10.1016/j.sab.2020.105863

Noiriél C., Oursin M., and Daval D. (2020) Examination of crystal dissolution in 3D: a way to reconcile dissolution rates at the laboratory? Geochimica & Cosmochimica Acta, in press

Licsandru G., **Noiriél C.**, Duru P., Geoffroy S., Abou Chakra A., Prat M. (2019) Dissolution - precipitation driven upward migration of a salt crust, Physical Review E, 100, 032802, doi: 10.1103/PhysRevE.100.032802
Gorny J., Dumoulin D., Alaimo V., Lesven L., **Noiriél C.**, Madé B., and Billon G. (2019) Passive sampler measurements of inorganic arsenic species in environmental waters: A comparison between 3-mercaptop-silica, ferrihydrite, Metsorb[®], zinc ferrite, and zirconium dioxide binding gels. Talanta, vol. 198, 518-526, doi: 10.1016/j.talanta.2019.01.127

Noiriél C., Oursin M., Saldi G., and Habberthür D. (2019) Direct determination of dissolution rates at crystal surface using 3D X-ray micro-tomography. ACS Earth and Space Chemistry, vol 3, n°1, 101-108, doi 10.1021/acsearthspacechem.8b00143

Renard F., McBeck J., Cordonnier B., Zheng X., Sanchez J. R., Kobchenko M., **Noiriel C.**, Zhu W., Meakin P., Fousseis F., and Dysthe D. K. (2018) Dynamic in situ three-dimensional imaging and digital volume correlation reveal strain localization and fracture coalescence in sandstone. *Pure and applied geophysics*, 10.1007/s00024-018-2003-x

Noiriel C., and Deng H. (2018) Evolution of planar fractures in limestone: the role of flow rate, mineral heterogeneity and local transport processes. *Chemical Geology*, vol 497, p. 100-114, 10.1016/j.chemgeo.2018.08.026

Gorny J., Billon G., **Noiriel C.**, Dumoulin D., Lesven L., and Madé B (2018) Redox behaviour of arsenic in the surface sediments of the Marque River (Northern France). *Journal of Geochemical Exploration*, vol. 188, p 111-122, 10.1016/j.gexplo.2018.01.021

Noiriel C. and Daval D. (2017) Pore-scale geochemical reactivity associated with CO₂ storage: new frontiers at the fluid-solid interface. *Accounts of Chemical Research*, vol.50, n°4, p.759-768, 10.1021/acs.accounts.7b00019

Leleu T., Chavagnac V., Delacourt A., **Noiriel C.**, Ceuleneer G., Aretz M., Rommevaux C. and Ventalon S (2016) Travertines Associated With Hyperalkaline Springs: Evaluation As A Proxy For Paleoenvironmental Conditions And Sequestration of Atmospheric CO₂. *Journal of Sedimentary Research*, vol 86, n°11, p. 1328-1343, 10.2110/jsr.2016.79

Noiriel C., Steefel C.I., Yang L., and Bernard D. (2016) Effects of pore-scale heterogeneous precipitation on permeability and flow. *Advances in Water Resources*, vol 95, p 125-137, 10.1016/j.advwatres.2015.11.013

Gorny J., Billon G., Dumoulin D., Lesven L., **Noiriel C.** and Madé B (2016) Chromium behavior in aquatic environments: a review. *Environmental reviews* 24(4), p 503-516, DOI: 10.1139/er-2016-0012

Gratier J.P., **Noiriel C.**, and Renard F. (2015) Experimental evidence for rock layering development by pressure solution. *Geology*, G36713, 10.1130/G36713.1

Gorny J., Lesven L., Billon G., Dumoulin D., **Noiriel C.**, Pirovano C., and Madé B (2015) Determination of total arsenic using a new Zn-ferrite doped resin ; application to redox speciation of arsenic in sediments. *Talanta*, vol 144, p 890-898, 10.1016/j.talanta.2015.07.016

Noiriel C. (2015) Resolving time-dependent evolution of pore scale structure, permeability and reactivity using X-ray microtomography. *Reviews in Mineralogy and Geochemistry*, vol 80: Pore scale geochemical processes, p 247-296, C.I. Steefel S. Emmanuel and L. Anovitz Eds

Gorny J., Dumoulin D., Lesven L., **Noiriel C.**, Madé B., and Billon G. (2015) Development and application of a HPIC-ICP-MS method for the redox arsenic speciation in river sediment pore waters. *Journal of Analytical Atomic Spectrometry*, vol 30, p 1652-1670, DOI: 10.1039/C5JA00095E

Gorny J., Billon G., Lesven L., Dumoulin D., Madé B. and **Noiriel C.** (2015) Arsenic behaviour in river sediments under redox gradient: a review. *Science of the Total Environment*, vol. 505, p 423-434, DOI: 10.1016/j.scitotenv.2014.10.011

Armynot du Châtelet E., **Noiriel C.**, and Delaine M. (2013) 3D morphological and mineralogical characterisation of testate amoebae, *Microscopy and Microanalysis*, vol 19, n°6, p 1511-1522, 10.1017/S1431927613013226

Noiriel C., Gouze P. and Madé B. (2013) 3D analysis of geometry and flow changes in a limestone fracture during dissolution, *Journal of Hydrology*, vol. 446, p 211-223, 10.1016/j.jhydrol.2013.01.035

Noiriel C., Steefel C., Yang L. and Ajo-Franklin J. (2012) Upscaling Calcite Precipitation Rates from Pore to Continuum Scale, *Chemical Geology*, vol. 318-319, p 60-74, 10.1016/j.chemgeo.2012.05.014

Noiriel C., Renard F., Doan M.L. and Gratier, J.P. (2010) Intense fracturing and fracture sealing induced by mineral growth in porous rocks. *Chemical Geology*, vol. 269, 197-209, doi:10.1016/j.chemgeo.2009.09.018

Bénézech P., Ménez B. and **Noiriel C.** (2009) CO₂ geological storage: integrating geochemical, hydrodynamical, mechanical and biological processes from the pore to the reservoir scale. *Chemical Geology*, vol. 265, n°1-2, 1-2 (Editorial of the special issue on CO₂ geological storage)

Noiriel C., Luquot L., Madé B., Raimbault L., Gouze P. and van der Lee J. (2009) Changes in reactive surface area during limestone dissolution: an experimental and modelling study, *Chemical Geology* vol. 265, n°1-2, 160-170

Noiriel C., Madé B. and Gouze P. (2007) Impact of coating development on the hydraulic and transport properties in argillaceous limestone fracture. *Water Resources Research*, 43, W09406, doi:10.1029/2006WR005379

Noiriel C., Gouze P. and Madé B. (2007) Time-resolved 3D characterisation of flow and dissolution patterns in a single rough-walled fracture. *IAH Selected Papers: Groundwater in fractured rocks*, J. Krasny and J.M. Sharp Eds, 629-642

Noiriel C., Bernard D., Gouze P. and Thibault X. (2005) Hydraulic properties and microgeometry evolution in the course of limestone dissolution by CO₂-enriched water. *Oil and Gas Science and Technology*, vol. 60, n°1-2, 177-192

Noiriel C., Gouze P. and Bernard D. (2004) Investigation of porosity and permeability effects from microstructure changes during limestone dissolution. *Geophysical Research Letters*, vol. 31, n°23, L24603

Gouze P., **Noiriel C.**, Bruderer C. Loggia D. and Leprovost R. (2003) X-Ray tomography characterisation of fracture surfaces during dissolution. *Geophysical Research Letters*, vol. 30, n°5, 71-1 71-4

PUBLICATION IN PROCEEDINGS

Noiriel C., Dubois M., Bernard D., Mosko R. and Guillaume D. (2009) Preliminary results on the determination of phase volume fraction in inclusions by synchrotron X-ray microtomography, Proceedings of the European Current Research on Fluid Inclusions conference (ECROFI XX), University of Grenada (Spain), p. 177-178

PUBLIC COMMUNICATIONS (CONFERENCE AND SEMINAR)

Noiriel C. (2022) Du cristal à la roche, imagerie quantitative par micro-tomographie à rayons X, Journées SFMC sur l'imagerie quantitative de l'atome à l'étoile, 21-22 Fev, Lille, Invited talk

Noiriel C., Seigneur N., Le Guern P. and Lagneau V. (2021) Evaluation of mineral precipitation into single fractures, Journées Etude en Milieu Poreux, Oct 26-27, Strasbourg, oral

Noiriel C. and Soulaire C. (2021) Evaluating the dynamics of fluid-mineral and fluid-rock interfaces, Goldschmidt conference, July 4-9, Lyon, invited virtual talk

Seigneur N., **Noiriel C.**, Le Guern P. and Lagneau V. (2021) Hydrogeochemical and mineral heterogeneity controls on the clogging of porous media, Goldschmidt conference, July 4-9, Lyon, virtual talk

Guren M., **Noiriel C.**, and Renard F. (2021) Linking microscale and macroscale dissolution rates in carbonates with X-ray tomography data and numerical modelling, Goldschmidt conference, July 4-9, Lyon, virtual talk

Licsandru G., **Noiriel C.**, Geoffroy S., Abou Chakra A., Duru P., Prat M. (2021) Laboratory controlled NaCl salt crusts, Cryspro VII - Crystallization in porous media. 3-5 June, Pau, virtual talk

Noiriel C. (2021) Challenges associated to mineral precipitation for modeling of the thermo-hydro-mechanical-chemical processes, Cryspro VII - Crystallization in porous media. 3-5 June, Pau, virtual talk

Noiriel C. (2020) Exploring mineral reactivity in 4D, 6th Earthflow seminar, Oslo, 11-12 June, invited contribution (remote)

Noiriel C., and Deng H. (2019) Evolution of planar fractures in limestone: an experimental and modeling study. Workshop Advances in the Simulation of reactive flow and TRANsport in porous Media, Nov 2-3, Pau, contributed talk

Noiriel C., Saldi G., Oursin M., Daval D., and Haberthür D. (2019) Determination of reaction rates at crystal surfaces using 4D X-ray micro-tomography. Goldschmidt conference, Barcelona, 18-23 August 2019, Spain, oral

Licsandru G., **Noiriel C.**, Geoffroy S., Abou Chakra A., Duru P., Prat M. (2018) Drying of a porous medium with salt crust formation. Physics of drying Conference, Nov 5-7, Ecole des Ponts ParisTech, Marne la Vallée, France, oral

Licsandru G., Diouf B., Naillon A., **Noiriel C.**, Geoffroy S., Abou Chakra A., Duru P., Prat M. (2018) Evaporation of a saline solution in porous media: an overview, 14th JEMP, Nantes, 8-10 October, oral

Licsandru G., Naillon A., **Noiriel C.**, Geoffroy S., Abou Chakra A., Duru P., Prat M. (2018) On the dynamics of salt crusts, CRYSPOM VI - Crystallization in porous media. 19-21 Sept., Hamburg, oral

Noiriel C. (2017) Improving reactive transport experiments and modeling in evolving porous/fractured media, ISIFOR Meeting on Reactive Transport, Pau, 13 December 2017, oral

Noiriel C. (2017) Challenging reactive transport modeling from pore-scale observations, Workshop Reactive Transport in the Earth and Environmental Sciences in the 21st Century, Amboise, 2-4 October 2017, oral

Noiriel C. and Daval D. (2017) Investigation of geochemical reactivity at the pore scale. Goldschmidt conference, Paris, 13-18 August 2017, France, poster

Harrison A.L., Oelkers E., **Noiriel C.** and Schott J (2017) Mineral growth under water-limited conditions. Goldschmidt conference, Paris, 13-18 August 2017, France, poster

Noiriel C., Saldi G. and Oursin M. (2016) 3D determination of dissolution rates on single crystals. Goldschmidt conference, Yokohama, 26-31 June 2016, Japan, poster

Noiriel C., Steefel C., Yang L., and Bernard D. (2016) Effects of pore-scale precipitation on permeability and flow, Goldschmidt conference, Yokohama, 26-31 June 2016, Japan, poster

Diouf B., Geoffroy S., Abou Chakra A., **Noiriel C.**, Bouvard D., Prat M. (2016) Granular medium surface heave due to internal crystallization, CRYSPOM V workshop, Toulouse, 6-8 June, oral

Lesven L., Gorny J., Dumoulin D., **Noiriel C.**, Madé B., and Billon G. (2016) Redox behavior of arsenic in surface sediments of Marque River (Northern France), 32nd International Conference on Environmental Geochemistry and Health, Jul 2016, Bruxelles, Belgium, oral

Gorny J., Lesven L., Billon G., Dumoulin D., **Noiriel C.**, Pirovano C., and Madé B. (2015) Determination of as speciation in river sediment using DGT techniques, DGT Conference 2015: from DGT Research to Environmental Assessment, Donostia-San Sebastián, Sep 2015, Spain, oral

Gorny J., Lesven L., Billon G., Dumoulin D., **Noiriel C.**, Pirovano C., and Madé B. (2015) Determination of total arsenic using a novel Zn-ferrite doped binding gel for DGT techniques DGT Conference 2015: from DGT Research to Environmental Assessment, Donostia-San Sebastián, Sep 2015, Spain, poster

Noiriel C. (2015) Measuring overall reaction rates with X-ray micro-tomography, Goldschmidt conference, Prague, 16-21 August 2015, Czech Republic, oral

Gratier J.-P., **Noiriel C.** and Renard F. (2015) The role of fluids in rock layering development: a pressure solution self-organized process revealed by laboratory experiments, EGU General Assembly Vienna, 12-17 April 2015, oral

Noiriel C. (2015) Application of micro-scale imaging for the study of reactive transport. Summer School Flow and Transport in Porous and Fractured media, Cargèse, Jul 2015, France, poster

Gratier J.-P., **Noiriel C.** and Renard F. (2014) Experimental layering development by indenter technique and application to fault rheology differentiation, AGU Fall Meeting, San Francisco, 15-19 December 2014, United States, oral

Gorny J., Lesven L., Dumoulin D., **Noiriel C.**, Madé B., and Billon G. (2014) Analytical development of IC-ICP-MS procedures for characterization of As and Cr speciation in pore water sediment, North-West Symposium of Young Scientists, Jun 2014, Villeneuve d'Ascq, France, poster

Noiriel C. and Le Guern P. (2014) Effects of precipitation on flow in fractures, RST, Pau, 27-30 October, France, invited talk

Leleu T., Chavagnac V., Delacour A., **Noiriel C.**, Aretz M., Ceuleneer G. and Rommevaux C. (2014) Biotic effect on carbon isotope compositions of travertine forming at hyperalkaline springs in the Oman ophiolite: consequences for interpretation of $\delta^{13}\text{C}$ proxy, RST, Pau, 27-30 October, France, poster

Noiriel C., Steefel C., Yang L., and Bernard D. (2013) Impact of calcite precipitation on flow alteration in porous media. Goldschmidt conference, Florence, 25-30 August 2013, Italia, oral

Orgogozo L., Martin R., Guibert R., Golfier F., **Noiriel C.**, Debenest G., Quintard M. (2013) Application of high performance computation methods to the study of transfers in porous media hosting biofilms. Interpore, Prague, 21-24 May 2013, Czech Republic, poster

Martin R., Orgogozo L., **Noiriel C.**, Guibert R., Golfier F., Debenest G., Quintard M. (2013) Large scale three dimensional modelling of porous media using parallel and multi-scale incompressible approach. AGU, Cancun, 14-17 May 2013, Mexico, oral

Noiriel C. (2012) Effects of geochemical reactions in altering flow and transport properties in fractures and porous media, Gordon Research Conference on Flow & Transport in Permeable Media, 24-29 June 2012, Les Diablerets, Switzerland, invited speaker

Noiriel C. (2011) 3D geometry and hydrodynamic modifications in fractured and porous rock samples through chemical alterations. AGU Fall Meeting, San Francisco, 5-9 December 2011, United States, invited talk

Steefel C., Yang L., **Noiriel C.**, and Ajo-Franklin J. (2011) Upscaling carbonate precipitation associated with CO_2 sequestration from pore to continuum scale. AGU Fall Meeting, San Francisco, 5-9 December 2011, United States, invited talk

Steefel C., **Noiriel C.**, Yang L., and Ajo-Franklin J. (2011) Upscaling pore scale carbonate precipitation to the continuum scale. Goldschmidt conference, Prague, 14-19 August 2011, oral

Steefel C., **Noiriel C.**, Yang L., Trebotich D., Molins S., and Ajo-Franklin J. (2010) Integrating experiments, characterization, and modelling to understand carbonate precipitation at the pore scale. AGU Fall Meeting, San Francisco, 13-17 December 2010, United States, invited talk

Noiriel C., Yang L., Ajo-Franklin J. and Steefel C. (2010) Impact of carbonate precipitation on flow and reactive transport in porous media. AGU Fall Meeting, San Francisco, 13-17 December 2010, United States, poster

Steefel C., **Noiriel C.**, Yang L., Trebotich D., Molins S., and Ajo-Franklin J. (2010) Integrating experiments, characterization, and modelling to understand carbonate precipitation at the pore scale. AGU Fall Meeting, San Francisco, 13-17 December 2010, United States, invited talk

Noiriel C. (2010) Application of X-ray 3D micro-tomography for the study of reactive transport in porous media, Summer School Flow and Transport, Cargèse, Aug 2010, France, poster

Renard F., **Noiriel C.**, Gratier J.-P., and Doan M.-L. (2009) Intense fracturation induced by mineral growth in porous rocks. AGU Fall Meeting, San Francisco, 14-19 December 2009, United States, poster

Noiriel C., Dubois M., Bernard D., Mosko R. and Guillaume D. (2009) Preliminary results on the volumetric property determination of inclusions by X-ray microtomography (synchrotron beam), ECROFI Meeting, Granada, Sept 2009, Spain

Noiriel C. and Madé B. (2009) On the importance of mineral surface areas in geochemical modelling: are surfaces reactive or specific? "Deep Saline Aquifers for Geological Storage of CO_2 and Energy", IFP international conference, 27-29 May 2009, Rueil-Malmaison, France, poster.

Renard F., **Noiriel C.**, Gratier J.- P., and Doan M.-L. (2009) Intense fracturation induced by mineral growth in porous rocks. EGU General Assembly Wien, 19-24 April 2009, Austria, oral

Noiriel C. (2008) Characterisation of fracture geometry changes using X-ray microtomography. Gordon Research Conference, 13-18 July 2008, Oxford, England, poster

Noiriel C., Luquot L., Madé B., Rimbault L., Gouze P. and van der Lee J. (2008) Changes in reactive surface area during dissolution process. RST Nancy, 21-25 April 2008, France, oral

Noiriel C., Gouze P. and Madé B. (2007) Evolution of early karst: impact of mineralogy on the development of preferential flowpaths in carbonates. EGU General Assembly Wien, 15-20 April 2007, Austria, oral

Noiriel C., Lagneau V., Madé B. and Gouze P. (2007) Modelling of diffusion-limited transport in an altered fracture during dissolution. EGU General Assembly Wien, 15-20 April 2007, Austria, poster

Noiriel C., Gouze P., Madé B. and Bernard D. (2004) X-Ray tomography characterisation of structural changes in fractured and porous carbonates during dissolution. EGU 1st General Assembly Nice, 25-30 April 2004, France, poster

Brosse E., Magnier C., **Noiriel C.** and Bernard D. (2003) Reducing uncertainty of geochemical modelling for a better prediction of CO₂ fate after geological sequestration, "CO₂ sequestration: advanced technologies for predicting and monitoring isolation performance", 226th American Chemical Society National Meeting, New York, NY, September 7-11, 2003

Noiriel C., Gouze P., Bernard D., Thibault X. and Madé B. (2003) Experimental characterisation of structure, geochemistry and hydrodynamic modifications caused by CO₂-rich fluid percolation in carbonates, "Gas-Water-Rock Interactions Induced by Reservoir Exploitation, CO₂ Sequestration, and other Geological Storage", Rencontres scientifiques de l'IFP, Rueil 18-20 novembre 2003, poster

Noiriel C., Gouze P., Madé B., Bruderer C., Leprovost R. and Poidras T. (2003) 3D characterisation of the micro-geometry changes of a single fracture in the course of dissolution, IAH International conference on Groundwater in fracture rocks, Prague 15-19 September 2003, oral presentation

Noiriel C., Madé B. and Gouze P., (2003). Self-affine characterization of fracture surface changes during dissolution. EGS-AGU-EUG Joint Assembly, session: *Hydrological Science – Scaling and Hydrology*, Nice, 6-11 April 2003, France, oral presentation.

Noiriel C., Gouze P., Loggia D., Bruderer C., Leprovost R. and Madé B. (2002) Experimental study of the dissolution of a single fracture using XR-CT. EGS 27th General Assembly, session: NP9.05, Nice, France, 21-26 April 2002, oral presentation