


RAMON MERCEDES-MARTÍN

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RESEARCH INTERESTS

- Carbonate stratigraphy and sedimentology (marine and freshwater environments)
- Carbonate sequence stratigraphy and basin analysis
- Carbonate petrography, petrology and geochemistry
- Mineral-microbial interactions

CURRENT EMPLOYMENT

June 2017- Recent. External carbonate consultant. **SZALAI Grup S.L.**

- Organise and deliver seminars and field-trips for the oil industry (carbonate sedimentology, petrography)
- Analysis and integration of borehole data (cuttings, cores, wireline logs), thin-sections, and polished slabs

EDUCATION

2014. PhD Universitat de Barcelona (UB), Spain. "*Microbial carbonates as outcrop analogues for the characterization and modelization of carbonate hydrocarbon reservoirs*" (Funded by REPSOL Exploration)

2007. Diploma: "*Modelling of Sedimentary Basins: applications to the study of oil systems. Evolution of sedimentary infill, subsidence and thermal history*". UB, Spain

2007. Diploma: "*Introduction to Exploration, Production and Liquefaction of Hydrocarbons*". REPSOL, Spain.

2005. MSc. Universitat Autònoma de Barcelona (UAB), Spain. "*Sedimentology and biostratigraphy of the Campanian syn-orogenic carbonates of Barranco de la Podega (Tresp Basin, NE Spain)*"

2001. BSc. Geology, UAB, Spain

PROFESSIONAL EXPERIENCE

2014-2017. Postdoctoral Researcher (BP funded). **University of Hull (UoH), United Kingdom**

- Build an innovative process-product approach to understand the geobiological origin and the subsurface facies distribution of continental carbonate reservoirs (Aptian, Presalt, South Atlantic)
- Develop laboratory experiments to assess the role of organic/inorganic additives in the formation/ inhibition of calcite reservoir fabrics
- Characterise the sedimentology, geochemistry, petrography and geobiology of fossil and recent freshwater carbonate settings as outcrop analogues for reservoir exploration

2007-2008. Well-site geologist. EPTISA, INGENIERIA Y SERVICIOS, S.A.U.

- Characterisation of geological materials and geotechnical mapping (Fieldwork planner)
- Siliciclastic and carbonate stratigraphy and sedimentology from cores and cuttings (Catalonia, Spain)

2006- 2007. Petrophysicist and Field Geologist. LOSAN, MECÁNICA DEL SUELO, S.A.

- Petrophysical characterization of soils and rocks, description of cores and cuttings from wells
- Acquisition of structural and mechanical field data
- Acquisition and interpretation of geophysical (refraction seismic, electric) data in the field
- Training of new personnel, interaction with operational teams and writing technical reports

2003-2004. Field Geologist. PALAEOTHERIA

- Project supervision and participation in the restoration of the Catalan Paleontological Heritage
- Stratigraphical and sedimentological analysis of alluvial-fluvial settings (Tertiary, Ebro Basin)

2001-2002. Field Geologist. CATALONIAN GEOLOGICAL SURVEY (IGC)

- Carbonate stratigraphical and sedimentological analysis of carbonate platforms (Cretaceous, Berguedà Basin)
- Taxonomic characterisation of micropaleontological samples

TEACHING EXPERIENCE**# Undergraduate Teaching****1st Year. Shropshire Field Course “Exploring worlds around us” (Co-Instructor, deliver) # UoH; 2016**

A three days’ field-trip to strengthen social bonds among students, allow them to interact with the environment and inspire them towards a career in geoscience. Close-knit group dynamics with students.

2nd Year. Castleton Reef Sedimentology Fieldtrip (Co-Instructor; develop, deliver) # UoH; 2014 to 2016

One-day field-trip to provide the basis for the stratigraphic description and sedimentologic interpretation of marine carbonate facies and environments. Close-knit group dynamics with students.

2nd Year. Almería Field trip “Messinian Geology and Basin Analysis” (Co-Instructor; deliver) # UoH; 2016

One-week field trip to gain insights on the regional geology, sedimentology, and basin analysis of the Spanish Miocene sedimentary sequences. Close-knit group dynamics with students.

3rd Year. Seminar: “Capitan Reef sedimentology and basin analysis” (develop, deliver) # UoH; 2016

One-day seminar on the stratigraphy, sedimentology and basin analysis of the Permian Capitan Reef platforms (USA). Progress exercises integrating outcrop, seismic, borehole and rock sample data.

3rd Year. Seminar: “Carbonate factories and products” (develop, deliver) # UoH; 2015

One-day seminar comparing carbonate systems with clastic ones. Provide the basic concepts to understand marine carbonate factories and predict facies distributions according to ecological thresholds.

- 1st Year. Burniston Clastic Sedimentology and ichnology Fieldtrip (Co-Instructor; deliver) # UoH; 2015**
One-day field-trip to gain insights on fluvial and deltaic facies associations and sedimentology. Close-knit group dynamics with students.
- 1st Year. Seminar “Fault-bounded basins & subsidence” (develop, deliver & assessment) # UoH; 2014**
Multiple day seminar to provide knowledge about the tectono-stratigraphic framework of sedimentary basins. Progress exercises integrating subsidence evaluation and application to the oil industry.
- 1st Year. Seminar “Sequence stratigraphy: basic concepts” (develop, deliver & assessment) # UoH; 2014**
Multiple day seminar to provide the basic elements of sequence stratigraphy and the sedimentary basin fill. Progress exercises integrating sedimentology, log correlations and parasequence stacking.
- 3rd Year. Seminar “Microbial carbonate Sedimentology” (develop & deliver) # UB; 2009, 2010**
Multiple day seminar to provide insights on microbial carbonate facies, stratigraphy, sedimentology and basin analysis of these systems. Thin-section description and interpretation of paleoenvironments.
- 1st Year. Seminar “General Geology” (develop & deliver) # UB; 2010**
One-day field-trip to provide insights about the basic geological concepts and rock types in outcrop (Collserola, Barcelona). Close-knit group dynamics with students.
- 2nd Year. Seminar “Sedimentary Petrology (clastics/carbonates)” (develop & deliver) # UB; 2009**
One-day field-trip to provide insights on clastic/ carbonate petrology and petrography in outcrop (Vallès-Penedès Basin, Vilafranca). Identification and characterisation of main grains, matrix and cements. Close-knit group dynamics with students

Postgraduate Teaching

Seminar on Microbial Carbonates to Patricio Villafañe, MSc (CONICET, Argentina)

Sedimentary petrography of lacustrine microbialites (Instructor; develop & deliver; 1 attendee) # UB; 2019

Keynote talk. 20th International Sedimentological Congress (ISC), Québec, Canada

The non-skeletal carbonates of the Cretaceous ‘Pre-salt’ lakes: when sedimentology meets crystal engineering (Deliver; 80 attendees) # Quebec; 2018

University of Hull GEES Seminars

Masterclass: “Carbonate Sedimentology: facing new challenges and strategies” (20 attendees) # UoH; 2014

Reservoir Geology and Geophysics Master

Masterclass: “Microbial carbonates as outcrop reservoir analogues” (15-25 attendees) # UB; 2013

University of Barcelona DPGG Geoscience Seminars

Carbonate sedimentology (Instructor; develop & deliver; 17 attendees) # UB; 2013

FIELDTRIPS, FUNDING and OTHER ACTIVITIES

Oil Companies and University visits

2020. Universidad Federal do Rio de Janeiro, UFRJ (scheduled). “Seminar in Continental carbonates: applications for the South Atlantic Presalt deposits” (14 days, 50 attendees). Leader.

2020. EQUINOR (scheduled). “Depositional models for spherulitic carbonates formed in alkaline, volcanic lakes (Carboniferous, Scotland): implications for the ‘Pre-Salt’ reservoirs” (1.5 days, 3 attendees). Leader.

2016. CSIC-Jaume Almera -STATOIL. “Integrated Structural Geological Research Studies. Fundamentals of carbonate-clastic interaction and tectonic styles in rift salts-basins” (5 days, 2 attendees). Leader.
2015. TOTAL. “Stratigraphic architecture of the microbial-dominated carbonate ramps of the Ladinian Catalan Basin (Triassic, NE Spain): implications for reservoir characterization” (3 days, 2 attendees). Leader.
2015. GEOPLAY. “Microbial carbonates as reservoir analogues” (1 day, 1 attendee). Leader.
2015. UNIVERSIDAD DE ZARAGOZA. “Microbial-dominated carbonate ramps (Middle Triassic, NE Spain): diversity and controlling factors” (2 days, 30 students). Leader.

Funding requested/ awarded

[Contact me!](#)

Research stays

2019 (6 months). IDAEA-CSIC.

Role: Refine thermodynamic models for alkaline, saline lakes, using petrographical and oil-industry borehole data and newly produced thermodynamic simulations using PHREEQC software. Writing up a research proposal to start a joint collaboration with Petrobras.

2018 (3 months). IDAEA-CSIC.

Role: Design carbonate precipitating experiments with organic polymers and inorganic substances under different thermodynamic conditions to understand calcite growth dynamics (petrographical styles). Petrographical description of the experimental precipitates. Develop new chemical models for alkaline saline lakes using PHREEQC software.

2018 (1 month). Vrije Universiteit Amsterdam.

Role: Perform SEM-EDS observations to determine the petrography and mineralogy of microbialite samples taken from Lake Clifton (Australia). Perform petrographical descriptions of experimental samples from laboratory experiments previously grown in the labs of the University of Hull.

2018 (4 months). Vrije Universiteit Amsterdam.

Role: Integrate stratigraphical, sedimentological, petrographical and isotopic data taken from samples in Mono Lake (California) to build a refined depositional model of the different sub-recent and fossil carbonate occurrences. Perform laboratory experiments using synthetic alkaline lake solutions to understand the role that water chemistry variations and mineral substrate have in precipitate petrography, mineralogies and crystal geochemistry.

2015 (6 days). University of Aberdeen.

Role: Carry out thin-section petrographical/ petrological descriptions on carbonate samples taken in outcrops from the East Kirkton Limestone Quarry, near Bathgate (Scotland). Perform organic geochemistry analysis to characterise biomarker composition.

2014 (1 month). Vrije Universiteit Amsterdam.

Role: Perform thin-section petrographical and mineralogical descriptions in carbonate samples from Mono Lake rocks (California).

2011 (6 days). University of Zaragoza.

Role: Perform thin-section petrographical descriptions and SEM observations from microbialite samples taken in Alcubierre section (Ebro Basin). Field mapping, sedimentary logging and rock sampling in the Ebro basin, Spain.

PUBLICATIONS

Peer-reviewed articles IF: 5-year impact factor Thomson Reuters® ϕ : citations in Google Scholar in April 2020

2020.

14. Mercedes-Martín, R., Buatois, L. Microbialites and trace fossils from a Middle Triassic restricted carbonate ramp in the Catalan Basin (Spain): evaluating environmental and evolutionary controls in an epicontinental setting. *Lethaia* (*accepted for publication*).
13. García-Ávila, M., Mercedes-Martín, R., Juncal, M., Diez, J. B. (2018c). New palynomorph data from the Middle Triassic carbonate platforms of eastern Iberia (Catalan Basin, NE Spain). *Comptes Rendus Geoscience* (*accepted for publication*).

2019.

12. Bastianini, L., Rogerson, M., Mercedes-Martín, R., Prior, T., J., Cesar, E. A., Mayes. What causes carbonates to form “shrubby” morphologies? An Anthropocene limestone case study. *Frontiers in Earth Sciences. Sedimentology, Stratigraphy and Diagenesis*, 7, 236. (IF=2.89, ϕ = 1)
11. Mercedes-Martín, R., Ayora, C., Tritlla, J., Sánchez-Román, M. The hydrochemical evolution of alkaline volcanic lakes: a model to understand the Cretaceous Presalt mineral assemblages. *Earth-Science Reviews*, 198, 102938. (IF=9.53, ϕ = 3)

2018.

10. Mercedes-Martín, R., Salas, R. Ladinian syn-rifting accommodation and microbialite development in the Triassic Catalan Basin (NE Spain). In: C. Quesada and J.T. Oliveira (Eds.), *Geology of Iberia: A Geodynamic Approach*. Springer, Berlin. (*Invited chapter review*). (IF= not-known, ϕ = 3)
9. Brasier, A., Wacey, D., Rogerson, M., Guagliardo, P., Saunders, M., Kellner, S., Mercedes-Martín, R., Matthews, A., Reijmer, J. A microbial role in the construction of Mono Lake carbonate chimneys?. *Geobiology*, 00, 1-16. (IF=4.15, ϕ = 5)

2017.

8. Mercedes-Martín, R., Brasier, A. T., Rogerson, M. R., Reijmer, J.J.G., Vonhof, H. B., and Pedley, H. M. A depositional model for spherulitic carbonates associated with alkaline, volcanic lakes. *Marine and Petroleum Geology*, 86, 168-191. (IF=3.64, ϕ = 13)
7. Rogerson, M. R.; Mercedes-Martín, R., Brasier, A. T., McGill, R.A.R., Prior, T., J., Vonhof, H. B., Fellows, S. M., Reijmer, J.J.G., McClymont, E., Matthews, A., and Pedley, H. M. Are spherulitic lacustrine carbonates an expression of large-scale mineral carbonation?: a case study from the East Kirkton Limestone, Scotland. *Gondwana Research*, 48, 101-109 (IF=7.17 ϕ = 11)

2016.

6. **Mercedes-Martín, R.**, Rogerson, M. R., Brasier, A. T., Vonhof, H. B., Prior, T. J., Fellows, S. M., Reijmer, J.J.G., Billing, I. and Pedley, H. M. Growing spherulitic calcite grains in saline, hyperalkaline lakes: experimental evaluation of the effects of Mg-clays and organic acids. *Sedimentary Geology*, 335, 93-102. (IF=2.93 ϕ = 27)

2015.

5. Brasier, A. T., Rogerson, M. R., **Mercedes-Martín, R.**, Vonhof, H. B., and Reijmer, J. J. G. A Test of the Biogenicity Criteria Established for Microfossils and Stromatolites on Quaternary Tufa and Speleothem Materials Formed in the "Twilight Zone" at Caerwys, UK. *Astrobiology*, 15 (10), 883-900. (IF=3.61 ϕ = 11)

2014.

4. **Mercedes-Martín, R.**, Arenas, C., and Salas, R. Diversity and factors controlling widespread occurrence of syn-rift Ladinian microbialites in the western Tethys (Triassic Catalan Basin, NE Spain). *Sedimentary Geology*, 313, 68-90. (IF=2.93 ϕ = 8)
3. **Mercedes-Martín, R.**, Salas, R., and Arenas, C. Microbial-dominated carbonate platforms during the Ladinian rifting: sequence stratigraphy and evolution of accommodation in a fault-controlled setting (Catalan Coastal Ranges, NE Spain). *Basin Research*, 26(2), 269-296. (IF=3.88 ϕ = 12)

2013.

2. **Mercedes-Martín, R.**, Salas, R., and Arenas, C. Facies heterogeneity and depositional models of a Ladinian (Middle Triassic) microbial-dominated carbonate ramp system (Catalan Coastal Ranges, NE Spain). *Marine and Petroleum Geology*, 46, 107-128. (IF=3.64 ϕ = 13)

2005.

1. **Mercedes-Martín, R.** Ammonites e inocerámidos del Santoniense-Campaniense del Barranco de la Podega (Cuenca de Tremp, Pirineos surcentrales): estudio paleontológico y biostratigráfico. *MSc Project. Universitat Autònoma de Barcelona*. 185 pp. (IF= - ϕ = 4)

Articles under review or embargo**2019.**

- Mercedes-Martín, R.**, Rogerson, M. R., Brasier, A. T., Reijmer, J.J.G., and Pedley, H. M. Towards a morphology diagram for terrestrial carbonates: evaluating the impact of carbonate supersaturation and organic additives in calcite precipitate morphology (*under embargo by British Petroleum until May 2020*)

Abstracts (including conference submissions)**2019.**

21. Bastianini, L., Rogerson, M., **Mercedes-Martín, R.** Prior, T., J., Mayes, W. What causes carbonates to form "shrubby" morphologies? An analog case study from hyperalkaline leachates. *Abstracts, IAS Meeting on Sedimentology, Rome, Italy*.
20. **Mercedes-Martín, R.**, Ayora, C., Tritlla, J., Sánchez-Román, M. Factors controlling mineral paragenesis and cyclothems development in the Cretaceous 'Presalt' alkaline lakes. *Abstracts, IAS Meeting on Sedimentology, Rome, Italy*.
19. **Mercedes-Martín, R.**, Ayora, C., Tritlla, J., Sánchez-Román, M. The hydrochemical evolution of alkaline volcanic lakes: a model to understand cyclothems evolution and mineral paragenesis in the South Atlantic Presalt lakes. *16th Bathurst Meeting of Carbonate Sedimentologists, Mallorca, Spain*.

18. Bastianini, L., Rogerson, M., **Mercedes-Martín, R.**, Prior, T., J., Mayes, W. What causes carbonates to form "shrubby" morphologies? An analog case study from hyperalkaline leachates. *57th British Sedimentological Research Group. Annual General Meeting. London.*
- 2018.**
17. **Mercedes-Martín, R.**, Ayora, C., Tritlla, J., Sánchez-Román, M. Disentangling the origin of the carbonate-clay-silica paragenesis in the Aptian 'Pre-salt' alkaline lakes: insights from hydrogeochemical. *20th International Sedimentological Congress (ISC), Québec, Canada.*
16. **Mercedes-Martín, R.** The non-skeletal carbonates of the Cretaceous 'Pre-salt' lakes: when sedimentology meets crystal engineering. *Keynote talk. 20th International Sedimentological Congress (ISC), Québec, Canada.*
15. García-Ávila, M., **Mercedes-Martín, R.**, Juncal, M., Diez, J. B. New palynomorph data from the Middle Triassic carbonate platforms of eastern Iberia (Catalan Basin, NE Spain). *Le 2^{ème} Congrès International sur le Permien et le Trias. Casablanca, Morocco.*
14. Sánchez-Román, M., **Mercedes-Martín, R.**, Aerts, J., Van Spanning, R., Rogerson, M., Brasier, A., Reijmer, J. Lake Clifton thrombolites: new insights from textural and metagenomic analyses. *Frontiers of Microbiology. New Frontiers in Astrobiology: Life vs. Abiotic Detection from Microscopic to Infinity.*
- 2017.**
13. **Mercedes-Martín, R.**, Rogerson, M., Brasier, A., and Pedley, M. Abiotic vs biotic-influenced carbonate nucleation: towards identifying their unique textural signatures. *Lyell Meeting 2017: Sticking together: microbes and their role in forming sediments, London, United Kingdom.*
12. Brasier, A., Wacey, D., **Mercedes-Martín, R.**, Reijmer, J., Rogerson, M., Hardistry, L., Capezzuoli, E. The fabric of continental carbonates: what have the microbes ever done for us? *Abstracts, IAS Meeting on Sedimentology, Toulouse, France.*
- 2016.**
11. **Mercedes-Martín, R.**, Rogerson, M., Brasier, A., and Pedley, M. A new depositional model of spherulitic carbonate settings: insights from a Carboniferous hyper-alkaline, volcanic-influenced lake. *AAPG Annual Convention and Exhibition, Calgary, Canada.*
10. **Mercedes-Martín, R.**, Rogerson, M., Brasier, A., Vonhof, H., Prior, T., Fellows, S., and Pedley, M. A mass-transfer model explaining the origin of Ca and Si in the 'Pre-Salt' South Atlantic lacustrine systems. *Abstracts, IAS Meeting on Sedimentology, Marrakech, Morocco.*
- 2015.**
9. **Mercedes-Martín, R.**, Rogerson, M., Brasier, A., and Pedley, M. Sediment-water interface calcium carbonate spherulites growing in organic-rich muddy substrates: fact or fiction? *Abstracts Bathurst Conference, Edinburgh, Scotland.*
8. **Mercedes-Martín, R.**, Rogerson, M., Brasier, A., McGill, R., and Pedley, M. Calcium carbonate spherulites or just botryoidal growth?: insights from a sublacustrine and alkaline carbonate setting. *Abstracts, 31st IAS Meeting of Sedimentology, Krakow, Poland.*
7. **Mercedes-Martín, R.**, Rogerson, M., Brasier, A., Pedley, M., Vonhof, H., and Reijmer, J. Constraining the link between spherulite growth and silicate minerals: insights from the reappraisal of East Kirkton Limestone (Lower Carboniferous, Scotland). *EGU Copernicus Meetings, Viena, Austria.*
6. Rogerson, M., **Mercedes-Martín, R.**, Brasier, A., Pedley, H. M., Vonhof, H. B., and Reijmer, J. Do biofilms and clays alter the chemistry and fabric of a hyper-alkaline, saline, non-marine carbonate precipitate? *EGU Copernicus Meetings, Viena, Austria.*

2013.

5. **Mercedes-Martín, R.**, Salas, R and Arenas, C. Microbial-dominated carbonate platforms during the Ladinian rifting: analogical models for microbialite reservoirs (Catalan Basin, NE Spain). *AAPG European Regional Conference, Barcelona, Spain.*

2011.

4. **Mercedes-Martín, R.**, Arenas, C., and Esteban, M. Ladinian carbonate sedimentation during Triassic rifting: sequence stratigraphy and evolution of accommodation in a fault-controlled setting (Catalan Coastal Ranges, Spain). *Abstracts, 28th IAS Meeting of Sedimentology, Zaragoza, Spain.*

2005.

3. **Mercedes-Martín, R.** El límite Coniaciense-Santonense en un sector del Prepirineo de Lérida: resultados preliminares en la Biostratigrafía de macroinvertebrados. (Eds: G. Meléndez et. al). *Seminarios de Paleontología de la Universidad de Zaragoza (SEPAZ). Miscelánea Paleontológica.*

2003.

2. **Mercedes-Martín, R.**, Caus, E. and Boix, C. Estudio micropaleontológico y biostratigráfico de los sedimentos cretácicos de la Hoja 292 (Sant Llorenç de Morunys, provincia de Barcelona). *Publications of the Catalan Geological Survey (SGC).*

2002.

1. Gallemí, J., López, G., Martínez, R., **Mercedes-Martín, R.**, and Pons, J.M. Coniacian/Santonian Boundary in Riu de Carreu Valley and Prats de Carreu, South-Central Pyrenees (N Spain). *Meeting on the Coniacian-Santonian Boundary (Bilbao, Spain). Subcommission on Cretaceous Stratigraphy & Instituto Geológico y Minero de España (IGME).*

Conference activities

Lyell Meeting 2017 (Geological Society of London): “*Sticking Together: microbes and their role in forming sediments*”. (Co-organiser).

33rd IAS Sedimentology 2017 Meeting (Toulouse, France): “*Continental carbonates: controls on facies types and depositional architecture*”. Co-Convener and invited Keynote Speaker: “The Pre-Salt alkaline lakes: a game-changing opportunity in sedimentology?”.

20th International Sedimentological Congress 2018 (Québec, Canada): “*Experimental and numerical approaches to understand carbonate crystallization, growth and dissolution*”. Invited Keynote Speaker: “Pre-salt’ lakes: when sedimentology meets crystal engineering”

MEMBERSHIPS (since 2009)

- International Association of Sedimentologists (IAS)
- Society for Sedimentary Geology (SEPM)
- American Association of Petroleum Geologists (AAPG)

MY ONLINE LINKS:

LANGUAGES

Spanish and Catalan: native

English: proficiency

Italian: beginner

Portuguese: beginner

PROFESSIONAL REFERENCES

Prof. Dr. Martyn Pedley (H.M.Pedley@hull.ac.uk) – University of Hull, UK – Academic collaborator

Prof. Dr. Mike Rogerson (M.Rogerson@hull.ac.uk) – University of Hull, UK – Post-doc Supervisor

Prof. Dr. Ramon Salas (ramonsalas@ub.edu) – University of Barcelona, Spain – PhD supervisor

Dr. Mónica Sánchez-Román (m.sanchezroman@vu.nl) – Vrije Universiteit, Holland – Academic collaborator

Dr. Mateu Esteban (mateu@szalai.es) – SZALAI Grup, Spain – Oil industry collaborator

Dr. Jordi Tritlla (jordi.tritlla@repsol.com) – Repsol Exploración, Spain – Oil industry collaborator