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Visit us online at
<http://cbth.uh.edu/>

Contacts:

Dr. Paul Mann:
pmann@uh.edu

Project E-mail:
cbthproject@gmail.com

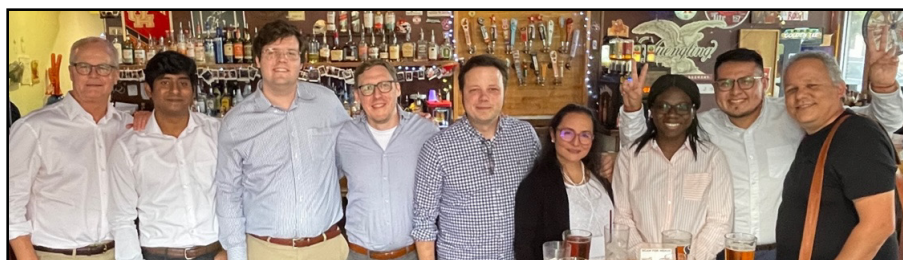
Edited by Jeff Storms:
jeffstormswork@gmail.com

Mailing Address:

312 Science and Research Bldg. 1
 Houston, TX 77204
 (712) 893-1731



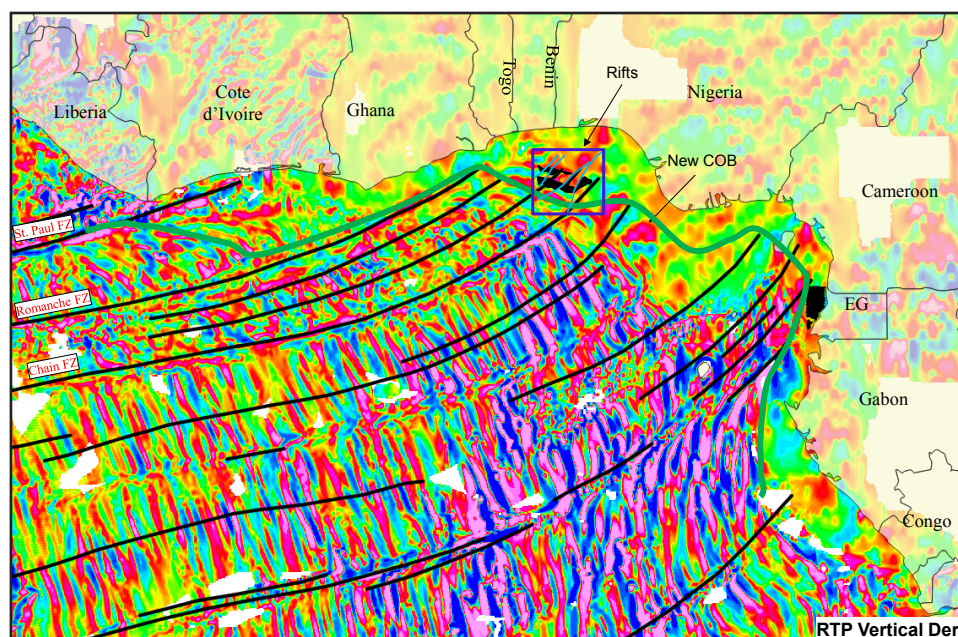
What's New



Happy New Year from the CBTH Project!

CBTH Annual Sponsor Meeting

This hybrid event was hosted on the UH campus and online via MS Teams on Friday, October 6, 2023, with over 60 attendees in total. We appreciate the continued support of the CBTH Project from our sponsors, data providers, and software support, and we look forward to a productive and innovative Phase VII.



The new initiative of CBTH Phase VII, reflected in our presentations at the annual sponsor meeting, is the exploration and basin modeling for the Equatorial and South Atlantic conjugate margins in Guyana, Brazil, Uruguay, Argentina, Gabon, Nigeria and Equatorial Guinea.



What's New

Year-end deliverables for sponsor representatives

This release includes the end-of-phase Atlas covering all Phase VI research, all presentations from the CBTH Annual Sponsor Meeting, recent publications and presentations, as well as updates to our GIS database, including updated surface grids. Our database now includes northern South America, Trinidad and Barbados, the Caribbean basins, Central America, the Bahamas, the Greater Antilles, the Gulf of Mexico, Brazil, northwest Africa, Nigeria, southwest Africa. We continue to update our archive of presentations and publications on our Sponsor website and on Geopost in real-time throughout the year. Please let us know if you have any questions regarding this year's delivery and stay tuned for more details.

CBTH student awards at the 2023 Robert E. Sheriff Lecture

Congratulations to CBTH students Juan Pablo Ramos, Jumoke Akinpelu, and Upal Shahriar, who won the 1st, 2nd, and 3rd Place awards, respectively, in the Advanced PhD category at the 2023 Robert E. Sheriff Lecture held at the Norris Conference Center in Houston on November 13. This event was hosted by the Houston Geological Society and the University of Houston Department of Earth and Atmospheric Sciences. Their topics included the hydrocarbon potential of the Colombian basin, Niger Delta, and Mauritania-Senegal margin, respectively.



Award-winners Juan Pablo Ramos, Jumoke Akinpelu, and Upal Shahriar present at the 2023 Robert E. Sheriff Lecture.

PhD student Kenneth Shipper wins HGS EXPO award

Congratulations to PhD student Kenneth Shipper for winning the award for Best 5 Minute Elevator Summary of his work on the Guyana margin at the HGS EXPO meeting in September 2023.

PhD student Juan Pablo Ramos wins award at BP internship

Congratulations to CBTH PhD student Juan Pablo Ramos, who received the 1st place award at the bpChallenge event during his internship with BP in summer 2023. At this event, nearly 40 interns across multiple disciplines presented their summer internship projects in competition. Special thanks to BP for providing Juan Pablo with this opportunity and for their continued support of CBTH graduates.



What's New

PhD student Kenneth Shipper selected for summer internship

Congratulations to Kenneth Shipper, who was selected for an internship with Equinor in Houston beginning in summer 2024.

Upcoming special issue on Caribbean tectonics in *G³*

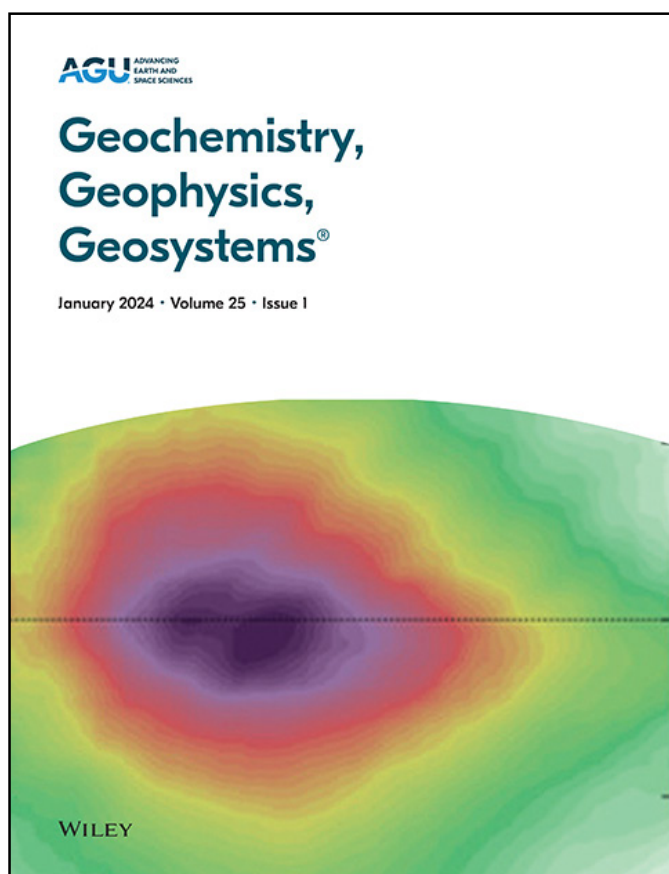
Co-editors for this issue entitled "A fresh look at Caribbean plate geosystems" include: Melody Philippon of Géosciences Montpellier, Jenny Collier of Imperial College London, Paul Mann of University of Houston and Yamirka Rojas-Agramontes of Johannes Gutenberg-Universität.

The volume is wide-ranging in time and space but focusses on some key events in Caribbean plate history: 1) eruption of the Bahamas hotspot-Central Atlantic magmatic province that led to the Triassic-Jurassic fragmentation of the Pangean supercontinent including work by CBTH student Kenneth Shipper; 2) the site of the interaction of the Caribbean arc with the Galapagos hotspot to form the massive volcanic event with global effects: Oceanic Anoxic Event 2 of Cenomanian-Turonian age including work by CBTH PhD student Juan Pablo Ramos; 3) the collision of the Caribbean arc with the rifted-passive margins of North and South America during the late Cretaceous

to late Cenozoic including work by Bryan Ott and Jose Gorosabel; and 4) terminal collision of the Panama arc with northwestern South America in the late Miocene-Pliocene that closed the deepwater Pacific-Atlantic connection and initiated the Gulf Stream includes work by Juan Pablo Ramos. All of these processes had a profound effect on the development of mineral resources, paleoclimate and modern-day hazards. This special volume follows up a 2019 Fall AGU special session on crustal structure, deformation and amalgamation of the Caribbean plate and welcomes trans-disciplinary contributions in the areas of geology, geophysics, geochemistry, sedimentary geology, tectonics, paleogeography, paleoceanography, paleoclimate, and biodiversity studies.

For more information, visit:

<https://agupubs.onlinelibrary.wiley.com/hub/journal/15252027/homepage/call-for-papers/SI-2023-000486>





Collaborating Graduate Students



HAMZA AKKA is a PhD student working in the area of geology and seismotectonics of northern Morocco and the Strait of Gibraltar at Abdelmalek Essaadi University in Tangier, Morocco, and collaborated with Dr. Mann who was a Senior Fulbright Fellow in Morocco from February -June 2023. This collaborative work was presented at the AGU Fall Meeting in December 2023.

New Post-Doctoral Researchers

MARVIN BAQUERO, PHD is a post-doctoral researcher with the CBTH Project who is working on a compilation study of radiometric ages from northwestern South America to better understand the location and timing of deformation between the Great Arc of the Caribbean and the continental margin of Ecuador, Colombia, and Venezuela. He received his BS in Geological Engineering and his PhD in Geological Sciences from Universidad Central de Venezuela in 2015, where he used new data from geochronology, geochemistry, and isotopes to improve the understanding of the tectonic history of western Venezuela.



New Allied Researchers



PHILIP J. BALL, PHD is the Chief of Geothermal Innovation at CATF and Senior Honorary Researcher at the Department of Geography, Geology and the Environment, Keele University. Philip has gained international experience working with NOC's, INOC's, IOC's and he also has experience working in established and start-up companies. Philip studied Geology and History at Keele University, UK, between 1994-1998, and in 1998 he obtained dual honours (B.Sc.) degree. Philip was awarded an MS degree in Basin Evolution and Dynamics in 2000, and a PhD in Earth Sciences in 2005 from Royal Holloway University, UK. In 2020, Philip completed his MBA with distinction from the London School of Business and Finance, UK, with specializations in carbon management, entrepreneurship and innovation. Philip is the owner of Geothermal Energy Advisors (GEA). Phillip is collaborating as a thesis committee member for CBTH studies in Guyana and the Red Sea.



New Allied Researchers

JEAN-CLAUDE HIPPOLYTE, PHD is currently a research geologist at CEREGE in Aix-en-Provence, France, and is currently collaborating with Paul Mann and Hamza Akka on the structure of northern Morocco and the Strait of Gibraltar and on Caribbean studies in Puerto Rico, the Virgin Islands, and Trinidad.



JOSE-LUIS GRANJA BRUÑA, PHD is currently a professor in geodynamics and applied tectonics at Universidad Complutense of Madrid. He was the host of Paul Mann during his Senior Fulbright Fellowship at Universidad Complutense from September 2022 to January 2023. He is collaborating with CBTH on research by Jose Gorosabel and Paul Mann on Cenozoic tectonics of the Beata Ridge and southern margin of Hispaniola.

JEAN-MARIE LAIGLE is the Founder of Xplorlab and creator of the ExCaliber software used for petroleum system analysis and modeling. He is working closely with CBTH researchers to apply ExCaliber to define model inputs to produce validated and highly-predictive, regional-scale basin models of active areas of exploration including: Guyana, Campos-Santos basins, Pelotas basin, basins along the northwestern margin of Africa, and the Delaware basin of west Texas.



ANDREW PEPPER is the Managing Director of This is Petroleum Systems, LLC and is currently an Adjunct Professor at the University of Houston. He is working with CBTH as a technical advisor on a variety of basin modeling studies.

JONATHAN ROTZIEN, PHD is the President of Basin Dynamics, LLC and is working with CBTH as an advisor on student projects. He is a siliciclastic specialist who utilizes E&P data for deepwater exploration. He was the lead editor of a comprehensive volume on deepwater exploration that included two chapters by Paul Mann and CBTH PhD graduate Md Nahidul Hasan (now at BP).

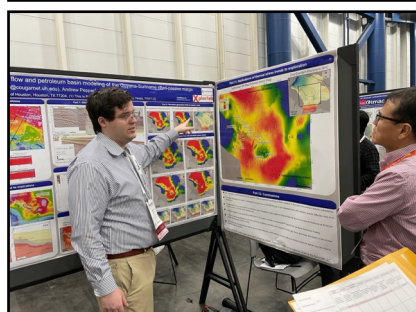
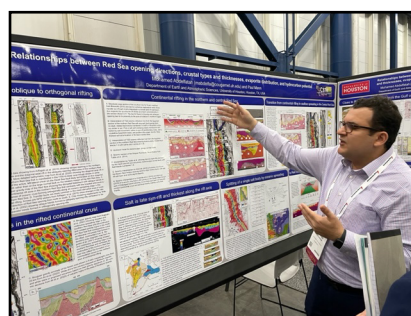
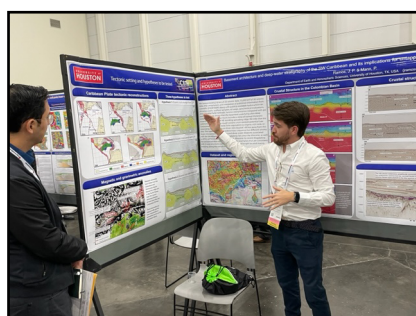




Recent Meetings

IMAGE 2023 (August 28 - September 1, 2023)

- o Mohamed Abdelfatah and Paul Mann - Relationships between Red Sea opening directions, crustal types and thicknesses, evaporite distribution, and hydrocarbon potential
- o Ruth Beltran and Paul Mann - Rift and thermal sagging controls on the distribution and thickness of the Barremian-Aptian Lagoa Feia formation which hosts a source-reservoir unit, deepwater Campos basin, Brazil
- o Sharon Cornelius - Southwestward tilting of the Espirito Santo-Campos-Santos salt basin, Brazil, and its implications for source rock potential in the external rift zone
- o Jose Miguel Gorosabel Araus, Jose-Luis Granja Bruña, Paul Mann, A. Gallego-Mingo, J.R. Mas Mayoral, S. Lopez-Andres et al. - Hydrocarbon prospectivity in the San Pedro offshore basin of the Dominican Republic based on identification of Upper Cretaceous and Lower Cenozoic source rock intervals
- o Juan Pablo Ramos and Paul Mann - Basement architecture and deep-water stratigraphy of the SW Caribbean and its implications for untapped petroleum systems in the Colombian Basin
- o Upal Shahriar and Paul Mann - Impact of Jurassic volcanic/non-volcanic margin boundary on HC prospectivity, Northwestern Africa
- o Kenneth Shipper and Paul Mann - Control of crustal thickness, type, and burial history on heat flow and petroleum basin modeling of the Guyana-Suriname rifted-passive margin



CBTH students Juan Pablo Ramos (top left), Mohamed Abdelfatah (top right), Ruth Beltran (bottom right), and Kenneth Shipper (bottom left) present at IMAGE 2023.



Recent Meetings

CBTH Annual Sponsor Meeting (October 6, 2023)

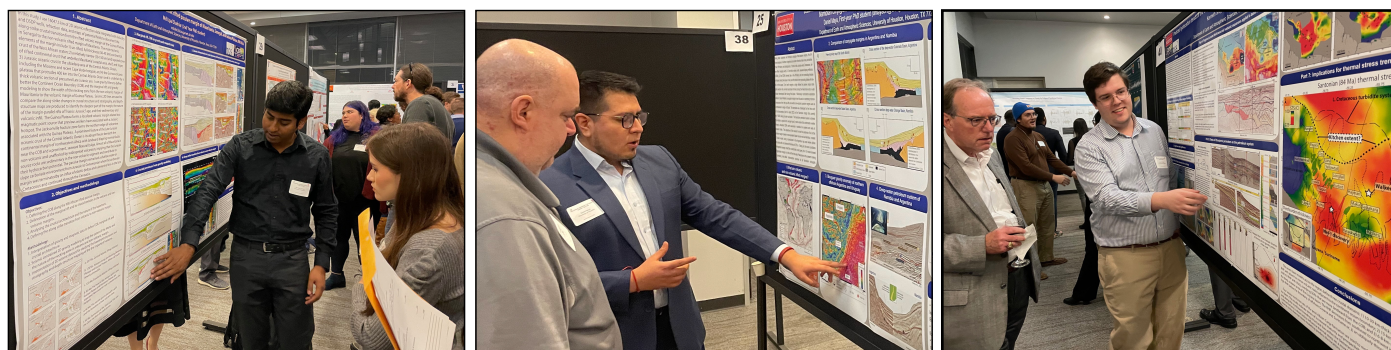
- o Mohamed Abdelfatah - Relationships between Red Sea opening directions, crustal types and thicknesses, evaporite distribution, and hydrocarbon potential
- o Jumoke Akinpelu - Hydrocarbon prospectivity of deeply-buried Cretaceous rifts of the western deep-water area of the Niger delta, Nigeria
- o Ruth Beltran - Exploring the external kitchen of the Campos Basin, offshore Brazil using cutting-edge 3D seismic data
- o Sharon Cornelius - Syn-rift and salt depositional thicknesses in the rift zones of the Santos-Campos-Espirito Santo salt basin, Brazil, resulting from the southwestward tilting of the basement
- o Jose Miguel Gorosabel Araus - New developments with the CBTH database
- o Jose Miguel Gorosabel Araus and Paul Mann - 3D and 2D mapping and basin modeling of the Rio Muni Basin, offshore Equatorial Guinea
- o Jose Miguel Gorosabel Araus, Paul Mann, and Jose-Luis Granja-Bruna - Basin modeling of the Eocene to Present forearc San Pedro Basin (Dominican Republic offshore)
- o Jose Miguel Gorosabel Araus, Paul Mann, Alanny Melo, David Castro, and David Oliveira, 2023, The Barreirinhas Basin: An unexplored frontier with significant potential in the Brazilian Equatorial Margin
- o Paul Mann - CBTH advances in understanding major hydrocarbon basins from West Texas to Guyana
- o Paul Mann - Meeting summary and discussion with sponsors on future directions of the project
- o Paul Mann - Tectonic controls on Mesozoic source rock thermal maturity of the 3500-km-long, rifted-passive margin of Morocco
- o Paul Mann - Welcome and overview of the CBTH Annual Sponsor Meeting (Phase VI, Year 3)
- o Daniel Maya - Transferring effective play concepts from hydrocarbon discoveries in Namibia's deep-water to its conjugate margin in Argentina
- o Chesney Petkovsek - Integration of refined geothermal gradients of the Delaware basin, west Texas, with observations from gravity and 2D and 3D seismic reflection data
- o Juan Pablo Ramos - Crustal structure in the Colombian Basin and its control on the distribution of potential source rock and play fairways in deep and ultra-deep waters of the Caribbean
- o Juan Pablo Ramos - Late Cretaceous-Recent tectonostratigraphic evolution of the Yucatan back-Arc basin, northern Caribbean Sea
- o Upal Shahriar - Crustal structure and hydrocarbon potential of the non-volcanic and volcanic, rifted-passive margins of Mauritania
- o Kenneth Shipper - Control of crustal thickness, type, and burial history on heat flow and petroleum basin modeling of the Guyana-Suriname rifted-passive margin
- o Kenneth Shipper - Crustal structure, deformational history, and tectonic origin of the Bahamas platform
- o Jeff Storms - CBTH website, integration with Geopost, and deliverables to sponsors



Recent Meetings

25th Annual Robert E. Sheriff Lecture (November 13, 2023)

- o Jumoke Akinpelu - Proposed Cretaceous hydrocarbon play based on syn-rift Cretaceous source rocks, deepwater area of the western Niger Delta, Nigeria
- o Ruth Beltran - Understanding pre-salt, rift and sag hydrocarbon plays of the deepwater Campos Basin, Brazil
- o Daniel Maya - Could the deepwater, rifted-passive margin of Argentina be as prolific in hydrocarbons as its Namibian conjugate margin? - Results from 1-D basin modeling
- o Juan Pablo Ramos - How oceanic and oceanic plateau crustal structure controls deepwater, hydrocarbon plays in the Colombian Basin, Caribbean Sea
- o Upal Shahriar - The crustal transition between the volcanic vs. non-volcanic rifted passive margin of Mauritania, Senegal, and Guinea Plateau, NW Africa
- o Kenneth Shipper - Predicted hydrocarbon trends of the Guyana-Suriname margin based on a 3D full-thickness lithospheric and basin model



CBTH students Upal Shahriar (left), Daniel Maya (center), and Kenneth Shipper (right) present at the 25th Annual Robert E. Sheriff Lecture at UH.

GCSSEPM 39th Annual Perkins-Rosen Research Conference (December 4 – 6, 2023)

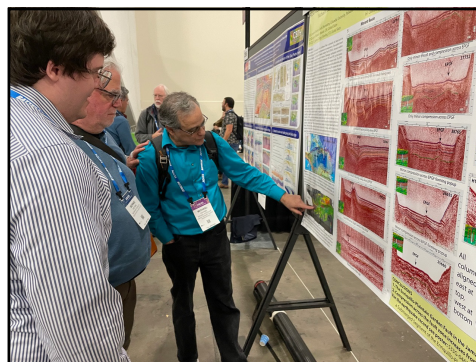
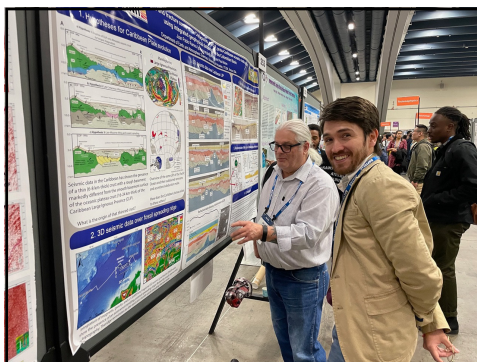
- o Paul Mann - The final frontier of deepwater exploration: the continent–ocean transition zone



Recent Meetings

AGU Fall Meeting 2023 (December 11-15, 2023)

- o Hamza Akka, Paul Mann, Jean-Claude Hippolyte, and Abdelilah Tahayt - Integration of Marine Geology of the Strait of Gibraltar with Paleostress History of the Tangier Peninsula, Morocco: Implications for the Messinian Gibraltar Corridor
- o Juan Pablo Ramos and Paul Mann - Spreading ridges and fracture zones of the Cretaceous, pre-CLIP, proto-Caribbean oceanic crust mapped using integrated geophysical datasets from the Colombian Basin
- o Jose Miguel Gorosabal Araus, Paul Mann, and Jose-Luis Granja - Structural and stratigraphic response of southern Hispaniola to the northeastward tectonic indentation by the Beata ridge
- o Kenneth Shipper and Paul Mann - Defining the continent-ocean boundary underlying the Bahamas carbonate platform using multiple geophysical and geological constraints



PhD students Juan Pablo Ramos (left) and Kenneth Shipper (right) present at AGU 2023.

Upcoming Meetings

HGS International Group Virtual Zoom Luncheon (January 17, 2024)

- o Juan Pablo Ramos – How oceanic and oceanic plateau crustal structure controls deepwater hydrocarbon plays in the Colombian Basin, Caribbean Sea
- o Kenneth Shipper - Predicted hydrocarbon trends of the Guyana-Suriname margin based on a 3D full-thickness lithospheric and basin model
- o To register for this event, visit: <https://www.hgs.org/civicism/event/info?id=2527>

GeoGulf 2024 (April 10-12, 2024)

8th Conjugate Margins Conference 2024 (May 27-29, 2024)



Recent Theses and Dissertations

- Bugti, M.N., 2022, Mesozoic plate reconstruction, salt tectonics, and hydrocarbon potential of the western Gulf of Mexico basin, PhD dissertation, University of Houston, 221 p.
- Hasan, M.N., 2022, Tectonostratigraphy, structural styles, and hydrocarbon prospectivity of the rifted-passive margins of the southern Gulf of Mexico and the Atlantic margin of Morocco, PhD dissertation, University of Houston, 265 p.
- Moore, B., 2022, Subsurface structure, stratigraphy, and hydrocarbon basin modeling of the Barbados Accretionary Prism, Master's thesis, University of Houston, 117 p.

Recent Publications

- Bugti, M.N., and Mann, P., 2023, Regional source rock thermal stress modeling and map-based charge access modeling of the Port Isabel passive margin foldbelt, northwestern Gulf of Mexico, Interpretation, v. 11, no. 4, T717–T734. <https://doi.org/10.1190/int-2023-0004.1>
- Cornelius, S., and Emmet, P., 2022, Difference in overpressure environments for the Western and Central Deepwater Gulf of Mexico, AAPG Bulletin, v. 106, no. 12, p. 2417–2442. <https://doi.org/10.1306/08182221123>
- Galhom, T., Mann, P., and Rudolph, K., 2022, Jurassic-Recent structure, stratigraphy, and basin modeling of the rifted-passive margin of the Tarfaya-Dakhla basin of southern Morocco, Marine and Petroleum Geology, 105626. <https://doi.org/10.1016/j.marpetgeo.2022.105626>
- Hasan, M.N., and Mann, P., 2022, Deepwater passive margin foldbelts, in J. Rotzien, C. Yeilding, R. Sears, F.J. Hernández-Molina, and O. Catuneanu (eds.), Deepwater Sedimentary Systems: Science, Discovery, and Applications, Elsevier, p. 119–147. <https://doi.org/10.1016/B978-0-323-91918-0.00016-5>
- Hasan, M.N., Pepper, A., and Mann, P., 2022, Basin-scale estimates of thermal stress and expelled petroleum from Mesozoic-Cenozoic potential source rocks, southern Gulf of Mexico, Marine and Petroleum Geology, 105995. <https://doi.org/10.1016/j.marpetgeo.2022.105995>
- Leslie, S., and Mann, P., 2022, Distribution and character of bottom simulating reflections in the western Caribbean offshore Guajira Peninsula, Colombia, in J. Mienert, C. Berndt, A. Tréhu, A. Camerlenghi, and C.-S. Liu (eds.), World Atlas of Submarine Gas Hydrates in Continental Margins, p. 333–341. <https://doi.org/10.1007/978-3-030-81186-0>
- Mann, P., 2022, Crustal structure and tectonostratigraphy of rifted-passive margins with applications for hydrocarbon exploration, in J. Rotzien, C. Yeilding, R. Sears, F.J. Hernández-Molina, and O. Catuneanu (eds.), Deepwater Sedimentary Systems: Science, Discovery, and Applications, Elsevier, p. 83–117. <https://doi.org/10.1016/B978-0-323-91918-0.00018-9>
- Ramos, J.P., and Mann, P., 2023, Late Cretaceous-Recent tectonostratigraphic evolution of the Yucatan back-arc basin, northern Caribbean Sea, Geochemistry, Geophysics, Geosystems, v. 24, no. 8, e2023GC010933. <https://doi.org/10.1029/2023GC010933>



Recent Publications

- Romito, S., and Mann, P., 2022, Crustal structure of the Camamu-Almada margin along the northeastern rift segment of Brazil from an integration of deep-penetration seismic reflection profiles, refraction, and gravity modeling, *Tectonics*, v. 41, no. 9, e2021TC007157.
<https://doi.org/10.1029/2021TC007157>
- Zhang, H., and Bird, D., 2022, Detecting hypogenic karst features in the northeastern Delaware Basin, west Texas: Applications of Full Tensor Gradient (FTG) gravity data, *Journal of Applied Geophysics*, 104889. <https://doi.org/10.1016/j.jappgeo.2022.104889>

Upcoming Publications

- Hippolyte, J.-C., Mann, P., Henry, P., Guihou, A., Deschamp, P., Ourliac, C., Godeau, N., Marie, L., and Gordon, M.B., 2024, U-Pb calcite dating connects faulting to sedimentary pulses: the role (place) of the Balcones Fault System in the evolution of the northern Gulf of Mexico basin, re-submitted to *Geology*.
- Petkovsek, C., 2024, Multi-layer 3D seismic attribute analysis and fault framework modeling of shallow extensional fault systems in the Delaware Basin, submitted to *Interpretation*.
- Shipper, K., and Mann, P., 2024, Crustal structure, deformational history, and tectonic origin of the Bahamas platform, submitted to *Geochemistry, Geophysics, Geosystems*.

Awards in 2023

- o Juan Pablo Ramos, PhD Candidate, 1st Place Presentation (Advanced PhD), Houston Geological Society and University of Houston Robert E. Sheriff lecture series and student poster competition
- o Jumoke Akinpelu, PhD Candidate, 2nd Place Presentation (Advanced PhD), Houston Geological Society and University of Houston Robert E. Sheriff lecture series and student poster competition
- o Upal Shahriar, PhD Candidate, 3rd Place Presentation (Advanced PhD), Houston Geological Society and University of Houston Robert E. Sheriff lecture series and student poster competition
- o Faith Walton, Undergraduate, 1st Place Presentation (Undergraduates), UH EAS Student Research Day 2023 (\$400)
- o Kenneth Shipper, PhD Candidate, 1st Place Presentation (Early PhD & MS), UH EAS Student Research Day 2023 (\$400)
- o Juan Pablo Ramos, PhD Candidate, 2nd Place Presentation (Advanced PhD), UH EAS Student Research Day 2023 (\$500)
- o Juan Pablo Ramos, PhD Candidate, UH EAS outstanding graduate work in Geology scholarship (\$500)
- o Juan Pablo Ramos, PhD Candidate, 1st Place Student Poster Presentation, GeoGulf23
- o Ruth Beltran, PhD Candidate, 3rd Place Student Poster Presentation, GeoGulf23



Thanks to our sponsors!

As we continue into Phase VII of the CBTH Project, we would like to thank our active and inactive company sponsors for their support in providing data and software that has fostered our progress in understanding the hydrocarbon potential conjugate rifted-passive margins in the CBTH study area. Your support has provided many opportunities for CBTH students to pursue research projects in the region, and your support is truly appreciated.

Active Sponsors for Phase VII, Year 1



Previous Sponsors (2005 - 2023)



Data Sharing



Technical Support

