

ALEXANDER P. BUMP

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PROFESSIONAL EXPERIENCE

University of Texas, Bureau of Economic Geology, Austin, Texas, USA Research Scientist Associate, 2019-present

Defining research program to apply hydrocarbon exploration and risking to exploration for and description of carbon storage sites. Working with industry partners and government regulators to create a strategic view of storage resources to prove and develop specific sites.

BP, Sunbury-on-Thames, UK

Head of Discipline, Exploration Structural Geology; Exploration Advisor, 2016-2018

Responsible for delivery of high-value projects, post-well structural analysis, development of structural geology capability, technology development and external engagement with the broader industrial and academic structural geology community.

Senior Exploration Geologist, Basin Analysis Team, 2015-2016

Screened the globe for new access opportunities, with focused projects on North Atlantic and East African margins. Created play catalog from over 100 basins, grouped by tectonic settings. Led project to define play characteristics of distal passive margins.

Senior Exploration Geologist, Angola Exploration Team, 2012-2015

Defined play fairways and prospects, and drilled 3 wells, including the Katambi discovery. Worked extensively with Cambridge and Oxford to understand thermal evolution of margin and de-risk previously unidentified controls on distal margin heat flow.

Exploration Geologist, Exploration Access Group, 2009-2012

Integrated large and diverse datasets to define new plays and evaluate exploration opportunities for the Middle East and onshore China.

BP, Houston, Texas, USA

Exploration Geologist, Global Unconventional Resources Group, 2008-2009

Defined heavy oil play types, screened the globe for exploration opportunities and identified three new regions with potential for >100Bn bbl OIP. Co-developed CRS methodology for heavy oil development and ranked available blocks for Venezuelan bid round.

Structural Geologist, Exploration & Production Technology Group, 2005-2008

Consulted for business units across the value chain from South American new ventures to Gulf of Mexico exploration and onshore US production.

Structural Geologist, Gulf of Mexico Shelf Exploration, 2005

Helped define and describe gas prospects. Responsibilities included 3D seismic mapping, structural restoration and fault seal analysis.

Structural Geologist, Gulf of Mexico Deepwater Exploration, 2002-2004

Mapped salt and interpreted salt body architecture and growth history for frontier exploration areas in Keathley Canyon. Contributed to the initial identification of and access for 4 super-giant Paleogene discoveries.

University of Arizona, Tucson, Arizona, USA**Research Associate, 2001-2002**

Applied newly developed trishear fold models to investigation of subsurface structure of basement-cored uplifts. Developed quantitative strain modeling technique to test theoretical trishear fold models against strain observed and mapped in the field.

Research Assistant, 2000-2001

Mapped reservoir-scale structures in the field to interpret kinematics of basement-cored uplifts. Applied mining industry software to model observed strains and define regional stress state at time of deformation. Integrated results with contemporaneous tectonics.

Teaching Assistant, 1996-2000

Wrote and taught undergraduate structural geology labs and field camp. Studied teaching methods and improved personal teaching evaluations from “Should get out of teaching and into research as fast as possible” to consistently “Excellent.”

BP, Anchorage, Alaska, USA**Intern Geologist, Prudhoe Bay Production Team, 2000**

Remapped oil-water contact in Prudhoe Bay, based on recent well logs. Noticed large disparities in well performance, examined wide range of possible causes and ultimately proved critical differences in drive mechanisms that allowed better well placement.

Mobil Oil, New Orleans, Louisiana, USA**Intern Geologist, Gulf of Mexico Deepwater Exploration Team, 1998**

Defined and mapped mega-sequences in a GoM mini-basin and described the structural and depositional history to lay the foundation for detailed prospect description.

TEACHING EXPERIENCE
BP*Formal Classes***Integrated Petroleum Exploration, 2017-2018**

Co-custodian and teacher of a 5-day comprehensive course in basin-scale geologic analysis and play description. Co-led a project to rewrite the course, leading to shorter, more interactive delivery and more effective learning.

Integrated Basin Dynamics, 2011-2018

Designed, co-developed and led Colorado Plateau-based field course with Nicky White (Cambridge University). Course focuses on system dynamics and the feedback loop between tectonics, subsidence and uplift, heat flow, sedimentation, structural geology and petroleum systems with the idea that understanding any one dimension can constrain all of them.

21st Century Structural Geology, 2003-13

Helped develop and teach five day course in basic structural geology from basin- to reservoir-scale and its application to petroleum systems. Led a project to rewrite the course that resulted in far more interactive and effective learning. Successfully delivered course to multi-cultural audiences in U.S., Canada, Trinidad and Tobago, U.K., and India.

Stage T: Exploration Geoscience, 2009-11

Designed and taught a short overview of exploration geoscience for downstream employees looking to get a broader view of the industry.

Online Short Courses (all initiated, designed and delivered by APB)

Structural Geology 101: Subsidence analysis and basin fill, 2018

Tools and insights of subsidence analysis and its use as a point of integration for structural geology, sedimentology and petroleum systems.

Structural Geology 101: Quick-look restoration techniques to aid interpretation, 2017

Tools to aid seismic interpretation by considering geologic process and ensuring structural viability.

Structural Geology 101: Assessing structural timing, 2017

Comprehensive overview of the techniques available to constrain structural timing.

Structural Geology 101: Rules of thumb for fault interpretation and QC, 2017

Displacement profiles, shapes and branching patterns of fault networks

Workshops (all initiated, designed and led by APB)

Rifting, subsidence and heat flow, 2018

Review of traditional models, examination of case studies and discussion of the role of dynamic topography.

Architecture and Prospectivity of Distal Passive Margins, 2017

Key characteristics of distal passive margins, ocean-continent transitions and their implications for hydrocarbon exploration.

Passive Margin Zonation and Characteristic Plays, 2016

Structural zonation of passive margins, examination of case studies and discussion of key differences between familiar proximal margins and hyper-extended ones.

Seismic Interpretation and Developing Multiple Models, 2016, 2017

The process of seismic interpretation/basin analysis and the art of defining and communicating multiple valid geologic models.

Salt Tectonics, 2016

Introduction to the geometry, mechanics and exploration implications of salt structures.

Thrust Belts and Foreland Basins, 2015

Introduction to the geometry, mechanics and characteristic petroleum risks of thrust belts.

Subsidence and Heat Flow of Cratonic Basins, 2010

Presentation of case studies and discussion of possible subsidence mechanisms, heat flow and the tests needed to advance.

Salt Stock Deformation and Potential Traps, 2006

Presentation of seismic observations, experimental evidence and discussion of possible traps and risks associated with salt stocks.

Royal Holloway University of London**Learning from Experience: Post-project analysis, 2018**

Presentation of case studies from oil and social science and discussion of the psychology of learning from failure as well as success.

Seismic Interpretation: Constructing Multiple Models , 2018

The process of seismic interpretation/basin analysis and the art of defining and communicating multiple valid geologic models.

Texas A&M University**Basin Analysis, 2009**

Wrote and delivered lessons on global tectonics, basin subsidence mechanisms and flexural basins as part of a graduate course.

University of Arizona**Crustal Rheology graduate seminar, 2002**

Initiated and led a graduate seminar investigating crustal rheology and why different regions of the globe deform in radically different ways.

Structural Geology undergraduate laboratory, 1996-2000

Wrote and taught undergraduate structural geology lab sessions, including some in the field and an overnight field mapping exercise.

Field Geology, 1997, 1999

Assisted in teaching a five week undergraduate field camp in Arizona, Colorado, Utah, and Nevada.

Introductory Geology laboratory, 1996

Taught lab sessions for basic undergraduate introductory geology course.

MENTORING EXPERIENCE

BP

Staff

Debapriya Paul, Indian PHD, 2016-2018

Serge Vasyutkin, Russian MSc., 2017-2018

Rizwan Fitriannur, Indonesian BSc., 2016-2018

Henda Rocha, Angolan MSc. (seconded from Sonangol), 2013-2015

Benedito Pio Aida, Angolan MSc. (seconded from Sonangol), 2012-2014

Mike Coffin, British MSc., 2010

Joni Clark, American MSc., 2008

Randy Partap, Trinidadian BSc., 2007-2008

Pablo Cervantes, Mexican PhD, 2007

Chris Walker, British PhD, 2006

Interns

Oliver Roberts, British MSc., 2012, Prospectivity of the Pinda Carbonate Play, Block 24, Angola.

Jennie Cook, American PhD, 2008, Conditions for deformation band formation, Holstein Field, Gulf of Mexico.

Cyrus Gillett, American MSc., 2007, Regional structure of the greater Green River Basin, Wyoming.

Serkan Arka, Turkish MSc., 2007, Structure and prospectivity of the Ene Basin, Peru.

Subho Banerjee, Indian PhD, 2006, Strain modeling of the Atlantis Anticline, Gulf of Mexico, and implications for sub-seismic fault prediction.

Shundong He, Chinese MSc., 2006, Geometry and structure of collapsed salt stocks: strain partitioning and potential reservoir compartmentalization.

Laura Chiaramonte, 2005, Argentinian PhD., Regional structure of the Perdido Fold Belt, western Gulf of Mexico.

University of Arizona

Undergraduates

Bilinski, G. E. and Sanders, A. E., 1999, The Structural Evolution of the Zone of Deformation Near the Comb Ridge, Utah: senior independent project, 21p.

EDUCATION

University of Arizona, Tucson, Arizona, USA

Ph.D. in Geology, 2001

Dissertation: *Kinematics, Dynamics, and Mechanics of Laramide Deformation, Colorado Plateau, Utah and Colorado*

Advisor: George Davis

University of Vermont, Burlington, Vermont, USA

Non-degree student in Geology, 1995-1996

Williams College, Williamstown, Massachusetts, USA

B.A. *cum laude* in Physics, 1993

University of Graz, Graz, Austria

Junior year abroad, 1991-1992

HONORS AND AWARDS

21 spot bonuses for technical contributions, leadership, mentoring, and teaching, 2003-18

Coach of the Year, Ful-on Tri Club, 2017

Keynote speaker, AAPG Hedberg Conference on Deepwater Foldbelts, 2009

Speaker of the Month, Arizona Geological Society, 2001

Outstanding Student Paper Award, Tectonophysics Division, AGU, 2000

Outstanding Student Research Award, Structure and Tectonics Division, GSA, 2000

Outstanding Student Research Award, GSA, 2000

PUBLICATIONS

Articles and Books

Davis, G.H., and Bump, A., 2009, Structural geologic evolution of the Colorado Plateau, in Kay, S. (ed.), *Backbone of the Americas: GSA Memoirs v. 204*, p. 99-124.

Bump A., Kennan L. Fallon J., 2008, Deformation History of the Andean Foreland, Peru, and its Impact on Present Day Structure. *Proceedings VI INGEPET, (EXPR-3-AB-05)*, 11p.

Bump, A.P., 2004, Three-dimensional Laramide deformation of the Colorado Plateau: competing influences of the Sevier thrust belt and the flat Farallon slab: *Tectonics*, v.23.

Bump, A.P., 2003, Reactivation, trishear modeling and folded basement in Laramide uplifts: Implications for the origins of intra-continental faults: *GSA Today*, v. 13, p. 4-10.

Bump, A.P. and Davis, G. H., 2003, Late Cretaceous to early Tertiary deformation of the northern Colorado Plateau: *Journal of Structural Geology*, v. 25, p. 423-442.

Bump, A.P., 2001, *Kinematics, Dynamics, and Mechanics of Laramide Deformation, Colorado Plateau, Utah and Colorado [Ph.D. Dissertation]: Tucson, University of Arizona. 149p.*

Ahlgren, S.G. and Bump, A. P., 2001, *Regional to Reservoir-Scale Structure and Tectonics of the Colorado Plateau: Tucson, University of Arizona Geostructure Partnership 2nd Annual Field Conference Guidebook, 44p.*

Davis, G.H., Bump, A. P., Garcia, p. E., and Ahlgren, S. G., 2000, Conjugate Riedel deformation band shear zones: *Journal of Structural Geology*. v. 22, p. 169-190.

Invited Talks

Bump, A.P., 2018, *Geology of the 2015 Nepal Earthquake, Ullens School, Kathmandu.*

Bump, A.P., 2017, *BP Exploration Geology, Guild of Tallow Chandlers, London.*

Bump, A.P. and Fugelli, E., 2016, *BP Exploration Geology, BP Board of Directors, London.*

Bump, A.P., 2013, *Ride Across America, Fulham Prep School, London.*

Talks and Posters

- Bump, A.P., Prendergast, W., and Witt, A., 2018, The Thermal History of Benguela Basin: Observations and Effects: *Heat Flow, Subsidence and Continental Break-up: A Case-study Workshop*, The Geological Society
- Bump, A.P., Prendergast, W., Porter, M. and Witt, A., 2017, Benguela Basin and the Prospectivity of Hyper-extended Margins: *AAPG International Conference and Exhibition*, American Association of Petroleum Geologists
- Bump, A.P., Gill, B., Pearse, C., Dodd, T., Adams, N., 2016, Thermal Evolution of the Benguela Basin, Angola: *The Roberts Conference, Passive Margins 2016*, Royal Holloway University of London.
- Bump, A.P., Gill, B., Pearse, C., Sabato-Ceraldi, T., Adams, N., 2016, Rifting, Subsidence and Evolution of the Benguela Basin, Angola: *Rifts 3* conference, The Geological Society
- Bump, A.P. 2014, Tectonic History of the Arabian Plate and the Distribution of Hydrocarbons: *Passive Margins and Petroleum Systems: The David Roberts Memorial Symposium*, Royal Holloway University of London.
- Bump, A.P. Neal, L. Sabato-Ceraldi, T., and Spasojevic, S., 2014, Tectonics of Rifting and Break-up in the Central Segment of the South Atlantic, Angola and Brazil: *Petroleum Geoscience of the West Africa Margi*, The Geological Society
- Bump, A.P. and Crosby, A., 2012, Subsidence History of the Arabian Plate: Setting the Stage for the World's Largest Hydrocarbon Province: *Industrial Structural Geology* conference, The Geological Society
- Fallon, J., and Bump, A. P., 2010, Detrital Zircon U/Pb dating of sandstones in Peru: Implications for provenience and paleogeography, *15th Peruvian Geological Congress*.
- Bump, A. P., 2009, The Atwater Foldbelt and its place in the global spectrum *Deepwater Fold and Thrust Belts*, AAPG Hedberg Research conference.
- Bump A., Kennan L., and Fallon J., 2008, Deformation History of the Andean Foreland, Peru, and its Impact on Present Day Structure Proceedings VI INGEPET, (EXPR-3-AB-05), 11p.
- Bump, A. P., Kennan, L., Fallon, J. A., 2008, Deformation history of the Andean foreland, Peru, and its impact on present-day structure: AAPG annual meeting.
- Bump, A. P., Hossack, J., Martinez, J. A., 2008, A pseudo-3D model of the Llanos foothills thrust belt, Colombia: *Fold-Thrust Belt Exploration* conference, The Geological Society
- Bump, A. P., 2007, Reverse faults, topography, and the mechanics of foreland basement-cored uplifts: AAPG annual meeting.

- Wiseman, T.R., Wagerle, R.N., Bump, A., Ballin, P., McCaslin, N., 2007, Integrating multi-disciplinary reservoir description to characterize connectivity in a complex minibasin fill: Holstein Field: AAPG annual meeting.
- Davis, G. H. and Bump, A. P., 2006, Tectono-structural evolution of the Colorado Plateau: *Backbone of the Americas, A global meeting presented by The Association Geologica Argentina and The Geological Society of America*, Geological Society of America Abstracts with Programs, No. 2, p.80.
- Bump, A. P. and Davis, G. H., 2005, Laramide deformation of the Colorado Plateau and the evolution of ancient fault arrays: GSA Abstracts with Programs, v. 37, p.378.
- Bump, A. P., 2005, An informal survey of structural geology in the major oil companies: AAPG Reservoir Deformation Research Group Annual Meeting.
- Bump, A. P., and Davis, G. H., 2002, Forward and inverse trishear modeling of the San Rafael and Waterpocket monoclines, Colorado Plateau, Utah: Geological Society of America Abstracts with Program, v. 34.
- Bump, A. P., 2002, Kinematics, Dynamics, and Mechanics of Laramide Deformation, Colorado Plateau, Utah and Colorado: Invited talk, Southwest Research Institute, San Antonio, Texas.
- Bump, A. P., 2002, Kinematics, Dynamics, and Mechanics of Laramide Deformation, Colorado Plateau, Utah and Colorado: Invited talk, Arizona Geological Society, Tucson, Arizona.
- Bump, A. P., 2002, Kinematics, Dynamics, and Mechanics of Laramide Deformation, Colorado Plateau, Utah and Colorado: Invited talk, University of Rochester, Rochester, New York.
- Stockli, D. F., Bump, A. P., Davis, G. H., Farley, K. A., Preliminary (U-Th)/He thermochronological constraints on timing and magnitude of Tertiary denudation of the Colorado Plateau: Geological Society of America Abstracts with Program, v. 34.
- Bump, A. P., 2001, The Colorado Plateau and its role in the Laramide Orogeny: Eos (Transactions of the American Geophysical Union), v. 82, p. F846
- Bump, A. P., 2001, Three-dimensional Laramide deformation of the Colorado Plateau: competing influences of the Sevier thrust belt and the flat Farallon slab: Geological Society of America Abstracts with Program, v. 33, p. A326
- Bump, A. P. and Pelletier, J., 2000, Reverse faults, topography, and the mechanics of foreland basement-cored uplifts: Eos (Transactions of the American Geophysical Union), v. 81, p. F1198.

- Bump, A. P., 2000, Laramide deformation on the northern Colorado Plateau: Complex patterns from simple controls: Geological Society of America Abstracts with Program, v. 32, p. A43.
- Bump, A. P., Davis, G. H., Bilinski, G. E., Sanders, A. E., and Kidder, S. B., 2000, Progressive development of brittle and semi-brittle structures on the monument uplift, Utah, and their implications for regional strain: Geological Society of America Rocky Mountain Section Abstracts with Program, v.32, p. A-4.
- Bump, A. P., 1999, Late Cretaceous to Eocene integrated structural and geodynamic analysis of five Colorado Plateau uplifts, Utah: AAPG Bulletin v. 83, p. 1883.
- Bump, A. P., 1999, Strain analysis of the San Rafael Swell, Utah, and its implications for the development of Colorado Plateau uplifts: Geological Society of America Abstracts with Program, v. 31, p. 238.
- Bump, A. P., Ahlgren, S. G., and Davis, G. H., 1997, The Waterpocket Fold, a tale of two uplifts, Capitol Reef National Park, Utah: Eos (Transactions of the American Geophysical Union), v. 78, p. F701.
- Davis, G. H., Garcia, P. E., Bump, A. P., Ahlgren, S. G., and Swanberg, K. A., 1997, Detailed internal structure of a conjugate strike-slip deformation band shear zone system in Navajo sandstone at a salient in the Waterpocket Fold, Capitol Reef National Park, Utah: Eos (Transactions of the American Geophysical Union), v. 78, p. F701.

Industry Reports

Full list available upon request

RESEARCH GRANTS

- 2018-2022 (co-authored with Nicky White, Cambridge University) BP-Cambridge Margins Phase IV: Dynamic Topography Through Space and Time. BP, £500,000.
- 2000-2002 (co-authored with George H. Davis) Inverse and Forward Modeling of the Utah System of Colorado Plateau Basement-Cored Uplifts: NSF, \$161,005.
- 2000-2001 Thermochronologic constraints on the Late Cretaceous tectonics of the Colorado Plateau: Geological Society of America Penrose Grant, \$3175.
- 2000-2001 Strain analysis and thermochemistry of the Monument uplift, northern Arizona: H. Wesley Pierce scholarship, administered by the H. W. Pierce Foundation, \$3200.

- 1999-2000 Late Cretaceous to Eocene integrated structural and geodynamic evolution of five Colorado Plateau uplifts, Utah: Geological Society of America Penrose Grant, \$1950.
- 1999-2000 Late Cretaceous to Eocene integrated structural and geodynamic evolution of five Colorado Plateau uplifts, Utah: L. Austin Weeks AAPG Grant-in-Aid, \$2000.
- 1998-1999 Laramide and Sevier: comparative strain analysis of the San Rafael Swell and the Pavant thrust, central Utah: Mobil Exploration and Producing U.S., \$3000.
- 1998-1999 Laramide and Sevier: comparative strain analysis of the San Rafael Swell and the Pavant thrust, central Utah: Geostructure Partnership, University of Arizona, \$5000.
- 1998-1999 Laramide and Sevier: comparative strain analysis of the San Rafael Swell and the Pavant thrust, central Utah: AMOCO (through Department of Geosciences, University of Arizona), \$2000.
- 1997-1998 Investigation into the structural context of a salient in the Waterpocket Fold, Capitol Reef National Park, Utah: Chevron (through Department of Geosciences, University of Arizona), \$700.

PROFESSIONAL SERVICES AND ACTIVITIES

- 2018 Co-convenor, “Heat Flow, Subsidence and Continental Break-up: A Case-study Workshop,” Geological Society of London
- 2016-2018 Advisory Board member, Royal Holloway University of London, Petroleum MSc program
- 2016-2018 Committee member, Geological Society of London Library Users Group
- 2014-2018 BP project manager, BP-Cambridge Margins Project, a joint research program with Cambridge University
- 2013 Co-designer of high-tech collaborative workspaces for new Sunbury exploration building, BP
- 2013 Designer and presenter of BP exploration workflows for basin analysis, play evaluation and prospect description
- 2010-2013 Technical interviewer for geoscience recruiting, BP

- 1998-2010 Reviewer for Tectonics, Geophysical Research Letters, Journal of Geoscience Education, Journal of Structural Geology
- 2010 MA committee member, University of Houston
- 2009 Chair, AAPG Reservoir Deformation Research Group
- 2008 Co-Chair, AAPG Reservoir Deformation Research Group
- 2005-2008 Leader, BP Houston Exploration and Production Technology Structural Geology Group
- 2005-2008 Global Course Custodian, 21st Century Structural Geology, BP
- 2007 Contributor, Design workshop for BP Houston Integrated Learning Center
- 2006 Panelist, Careers in Geoscience, Williams College
- 2005 Contributor, Design workshop for BP Structure and Geomchanics Research Program
- 2000-2001 Coordinator, Structure/Tectonics Group meetings, University of Arizona
- 1999 Organizer, seminar on selling a graduate degree in Geosciences, University of Arizona
- 1998-1999 Graduate Representative, Tectonics Search Committee, University of Arizona

OTHER SERVICES AND ACTIVITIES

- 1984-present Endurance sports: Over 350 races completed in cross-country skiing, running, rowing, mountain biking, road cycling, swimming and triathlon with individual wins in five different sports. Finishes include three Ironmans, three ultra-marathons, two 24-hour races and many 100+ mile cycle races.
- 2015-2018 Coach, Ful-On Triathlon Club.
- 2011-2018 Coach, BP run club
- 1996-present Furniture construction: Home now approximately half furnished in hand-made, self-designed pieces.
- 2010 Cycled John O’Groats to Land’s End in nine days, raised £1000 for Paralympics GB

- 2004-2008 Transition Area Director, Jeff and Brede's Intergalactic Triathlon
- 2005 President, Houston Racing Triathlon Club
- 2004 Board member, Houston Racing Triathlon Club
- 1994 Cycled across U.S.: 4262 miles in 54 days, self-supported

PROFESSIONAL AFFILIATIONS

Geological Society of London
Geological Society of America
American Association of Petroleum Geologists