

<b>Name</b>	<b>Bernard COLLETTA</b>
<b>Date of Birth</b>	March 24th, 1950
<b>Nationality</b>	French
<b>Current Position</b>	<b>Independent Principal Advisor in Structural Geology</b>

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**Education** PhD degree in Geology, Grenoble University. Thesis title: Evolution néotectonique de la partie méridionale du bassin de Guercif -Maroc oriental-(1977).

DEA degree in “applied geology”, Grenoble University (1974)

**Languages** French, Spanish, English.

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## KEY QUALIFICATIONS

**Bernard Colletta** is a structural geologist expert in brittle deformation (faults and joints) and section balancing. He developed a strong expertise in normal faulting and rift systems (Basin and Range, Rhine Graben, Suez Rift) as well as in petroleum systems of foothills and compressional provinces: Eastern Cordillera (Colombia), Merida Andes (Venezuela), Subandean Cordilleras (Bolivia), Northern and Southern French Alps, Jura Mountains, Barbados and Makran accretionary prisms,...) folds and related fracture in Oman, Kuwait (Burgan field) and Argelia (Rhourde Nouss field). He is a specialist in physical analogue modelling of geological structures and developed the experimental laboratory in IFP. He has a good experience in management of research teams and was the former head of the Geology-Geochemistry-Geophysics research division in IFP (130 people). He has also a good experience in teaching and training in structural geology for the oil industry. His main fields of expertise are structural geology, seismic interpretation and mechanisms of complex geological deformations.

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## PROFESSIONAL EXPERIENCE RECORD

### ***Independent Principal Advisor in Structural Geology (from 2014 to Present)***

2014-2017 CVA group Expert in Structural Geology:  
Expert in various international exploration projects developed by Beicip-Franlab : Offshore Nova Scotia, Sydney Basin (Canada), Malaysia, Middle East (Qatar, Koweit)

### ***IFP Group (from March 1983 to November 2013)***

2008-2011 ***BeicipFranlab (from June 2008 to November 2013 )***  
Exploration Project Director  
Project leader of the Play Fairway Analysis in the Offshore of Nova Scotia (Canada)  
Structural geology expert for various projects in Beicip Franlab (structural analysis Rhourde Nouss, Argelia, faults and fractures analyses Burgan field, Kuwait, offshore West Africa)  
Project manager of international (Africa, Indonesia, South America) and national (Venezuela) exploration project for PDVSA

- IFP - Institut Français du Pétrole (1983- 2008)***
- 2001-2008 Head of the Geology-Geochemistry-Geophysics research division  
Merge of the Geology–Geochemistry division with the Geophysics division (2006)  
Development of the mineral geochemistry and diagenesis activity (2004)  
Organization of the Geology-Geochemistry division in 3 departments: structural geology, sedimentology, geochemistry (2002)
- 1996-2001 Project leader in the Geology Geochemistry Division  
Petroleum & tectonics  
Deformation modes and HC traps  
Deep offshore petroleum systems  
Methodology for exploration in complex structural provinces  
Physical-analogue modelling of complex structures
- 1983-1995 Research geologist  
Hydrodynamic properties of faults  
Suez rift synthesis (tectonic evolution and prospect analysis)  
Balanced cross-sections (French Alps, Colombia, Venezuela, Iran..)  
Faults and joints analysis (French Alps, Oman)  
Thrust tectonics (Colombia, Venezuela, Alps, Iran, Pakistan ...)  
Sandbox experiments analysed by computed X-ray tomography

***French “Ministère des Relations Extérieures” (1978-1982)***

- 1978-1982 Employee of the French government in a cooperative program for teaching and research activity at the “Universidad Autonoma de Mexico” and the “Universidad Autonoma de Sonora (Mexico).  
Teaching: Structural Geology and Plate tectonics  
Research: Fault and fracture analysis in the Basin & Range province and in the Baja California Peninsula.

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**PUBLICATIONS**

Author and co-author of more than 135 articles, publications, and communications in international journals or conferences.

Author of 3 IFP scientific video films  
X-ray tomography in sand box experiments-Thrust propagation and tear faults  
Thrust propagation experiments  
Extensional faulting models

Editor of a special publication of the “Revue de l’IFP”. Oil & Gas Science and Technology Vol. 58, No. 2, 2003: Insight into Petroleum Geochemistry

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**NATIONAL RESPONSABILITIES**

Associate professor, IFP School 1993-2001  
Member Scientific committee of the BRGM 2003-2008  
Member Steering Committee of the GDR Marges continentales 2002-2007

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## INTERNATIONAL MEETING ORGANIZATION

Field trip leader in the Gebel Zeit (Egypt) at the Hedberg Conference 1986 "Gulf of Suez and Red sea conference"  
Short Course on "Physical analogue structural models" EAGE Stavanger 1993  
Chairman oral session "Understanding Complex traps-Structural and stratigraphics. AAPG international Conference and Exhibition Cairo 2002.  
Member Scientific advisory board Geomod 2004  
Technical program co-chair AAPG International Conference and Exhibition Paris 2005  
Chairman Poster session "Structural geology and sedimentology in E&P 70<sup>th</sup> EAGE Conference & Exhibition Rome 2008

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## MEMBERSHIP

American Association of Petroleum Geologists Member since 1993  
European Association of Geoscientist and Engineers (from 1990 to 2008)

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## HONORS AND AWARDS

Chevalier dans l'Ordre des Palmes Académiques  
Chevalier de l'Ordre National du Mérite

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## LIST OF PUBLICATIONS

1975

COLLETTA B. et RAMPNOUX J.P., 1975. Esquisse structurale du Bassin de Guercif (Maroc). *Annales du Centre Universitaire de Savoie*, 2, Sc. Nat., p. 147-157, 6 fig., 4 pl.

DOUDOUX B. et COLLETTA B., 1975. Le synclinal Charbon-Trélod, Massif des Bauges (Savoie). *Annales du Centre Universitaire de Savoie*, 2, Sc. Nat., p. 69-93, 3 fig., 4 pl.

1977

RAMPNOUX J.P., ANGELIER J., COLLETTA B., FUDRAL S., GUILLEMIN M. et PIERRE G., 1977. Les résultats de l'analyse structurale et de la néotectonique des littoraux. B.-Les résultats de l'analyse structurale au Maroc. *Bulletin de la Société Géologique de France*, (7), 19, n°3, p. 591 et p. 594-599, bibl. p. 604-605, 3 fig.

COLLETTA B., 1977. Evolution néotectonique de la partie méridionale du Bassin de Guercif (Maroc Oriental). *Thèse 3ème cycle U.S.M. Grenoble*, 136 p., 45 fig., 2 pl. h.t.

GROUPE DE RECHERCHE NEOTECTONIQUE DE L'ARC DE GIBRALTAR, 1977. L'histoire tectonique récente (Tortonien à Quaternaire) de l'Arc de Gibraltar et des bordures de la mer d'Alboran. Introductions et conclusion générales. *Bulletin de la Société Géologique de France*, (7), 19, n°3, p. 575-576 et p. 605-614, 5 fig.

1979

RAMPNOUX J.P., ANGELIER J., COLLETTA B., FUDRAL S., GUILLEMIN M. et PIERRE G., 1979. Sur l'évolution néotectonique du Maroc septentrional. *Géologie Méditerranéenne*, 6, n°4, p. 439-464, 20 fig.

COLLETTA B. et ORTLIEB L., 1979. La actividad tectonica cuaternaria en la extremidad meridional del sistema de San Andres. In : *Memoria simposio "Los Asentamientos Humanos y la Falla de San Andrés"* Tijuana, S.A.H.O.P. Mexico, p. 75-90, 7 fig., 1 pl

1981

COLLETTA B. et ANGELIER J., 1981. Faulting evolution of the Santa Rosalia Basin, Baja California Sur, Mexico. In : *Geology of Northwestern Mexico and Southern Arizona*, L. Ortlieb and J. Roldan Eds., U.N.A. Mexico, p. 265-274, 4 fig., 1 pl.

COLLETTA B., ANGELIER J., CHOROWICZ J., ORTLIEB L. et RANGIN C., 1981. Fracturation et évolution néotectonique de la péninsule de Basse Californie (Mexique). *Comptes Rendus de l'Académie des Sciences*, Paris, Série II, 292, n°21, p. 1043, 1 pl.

COLLETTA B., 1981. Réseaux de fractures et dérive de la Basse Californie par rapport au continent Nord-Américain. *Comptes Rendus de l'Académie des Sciences*, Paris, série II, 292, n°21, p. 1141-1144, 1 fig.

ANGELIER J., COLLETTA B., CHOROWICZ J., ORTLIEB L. et RANGIN C., 1981. Fault tectonics of the Baja California Peninsula and the opening of the Sea of Cortez, Mexico. *Journal of structural geology*, 3, n°4, p. 347-357, 16 fig.

1982

CHOROWICZ J., COLLETTA B., DEMANT A., ANGELIER J., ORTLIEB L. et RANGIN C., 1982. Un volcan partagé par une faille près de Santa Rosalia (Basse Californie, Mexique) : relation avec le système de failles de San Andreas et l'ouverture du Golfe de Californie. *Photo interprétation*, 2, fasc. 1-2c, p. 15-16.

CHOROWICZ J., COLLETTA B., ANGELIER J., ORTLIEB L. et RANGIN C., 1982. Interprétation des images spatiales du secteur de Santa Rosalia (Basse Californie, Mexique) et le problème de l'ouverture du Golfe de Californie. *Photo interprétation*, 2, fasc. 1-2a, p. 5-8, 2 pl.

COLLETTA B. et ANGELIER J., 1982. Sur les systèmes de blocs faillés basculés associés aux fortes extensions : étude préliminaire d'exemples ouest-américains (Nevada, U.S.A. et Basse Californie, Mexique). *Comptes Rendus de l'Académie des Sciences*, Paris, série II, 294, p. 467-469, 1 fig.

ANGELIER J. et COLLETTA B., 1982. Tension fractures and extensional tectonics. *Nature*, 301, n°5895, p. 49-51.

1983

COLLETTA B. et ANGELIER J., 1983. Tectonique cassante du nord-ouest mexicain et ouverture du golfe de Californie. *Bulletin des Centres de Recherches Exploration-Production Elf-Aquitaine*, 7, n°1, p. 433-441, 6 fig.

1985

ANGELIER J., COLLETTA B. et ANDERSON R.E., 1985. Neogene paleostress changes in the basin and range: a case study at Hoover Dam, Nevada-Arizona. *Geological Society of America Bulletin*, 96, p. 347-361.

1987

CHENET P.Y., COLLETTA B., LETOUZEY J., DESFORGES G. et al., 1987. Structures associated with extensional tectonics in the Suez rift. In : *Continental extensional tectonics*, M.P. Coward et al eds., Geological Society, Special publication n°28, p. 551-558.

MORETTI I. et COLLETTA B., 1987. Spatial and temporal evolution of the Suez rift subsidence. *Journal of geodynamics*, 7, p. 151-168.

1988

COLLETTA B., LE QUELLEC P., LETOUZEY J. et MORETTI I., 1988. Longitudinal evolution of the Suez rift structure (Egypt). *Tectonophysics*, 153, p. 221-233.

MORETTI I. and COLLETTA B., 1988. Fault-block tilting: the Gebel Zeit example, Gulf of Suez. *Journal of structural geology*, 10, n°1, p. 9-19.

MORETTI I., COLLETTA B. and VIALLY R., 1988. Theoretical model of block rotation along circular faults. *Tectonophysics*, 153, p. 313-320.

1989

ORTLIEB L., RUEGG J.C., ANGELIER J., COLLETTA B., KASSER M. et LESAGE P., 1989. Geodetic and tectonic analyses along an active plate boundary: the central Gulf of California. *Tectonics*, 8, n°3, p. 429-441.

RICHARD P., BALLARD J.F., COLLETTA B. et COBBOLD P., 1989. Naissance et évolution de failles au-dessus d'un décrochement de socle : modélisation analogique et tomographie. *Comptes Rendus de l'Académie des Sciences*, série II, 309, n°20, p. 2111-2118.

1990

COLLETTA B., HEBRARD F., LETOUZEY J., WERNER P. et RUDKIEWICZ J.L., 1990. Tectonic style and crustal structure of the Eastern Cordillera (Colombia) from a balanced cross-section. In : *Petroleum and tectonics in Mobile Belts, Proceedings of the 4th IFP Exploration and Production Research Conference*, Bordeaux, November 14-18 1988, J. Letouzey Ed., Editions Technip, p. 81-100.

PINET B. and COLLETTA B., 1990. Probing into extensional sedimentary basins: comparison of recent data and derivation of tentative models. *Tectonophysics*, 173, n°1/4, p. 185-197.

RIVA E., COLLETTA B., GRUNEISEN P. et MORETTI I., 1990. Western Sinai (Egypt): evidence of a pre-rift compressional event during upper Cretaceous time. In: *10th EGPC Petroleum and Production Conference*, Cairo, November 17-20 1990, 12 pages.

1991

BRUN J.P., WENZEL F., ECORS-DEKORP Team (BLUM R., BOIS C., COLLETTA B. and al.), 1991. Crustal-scale structure of the southern Rhine graben from ECORS-DEKORP seismic reflection data. *Geology*, 19, n°7, p. 758-762.

COLLETTA B., LETOUZEY J., PINEDO R., BALLARD J.F. and BALLE P., 1991. Computerized X-ray tomography analysis of sandbox models: examples of thin-skinned thrust systems. *Geology*, 19, n°11, p. 1063-1067

1992

DOUDOUX B., ROSSET J., BARFETY J.C., CARFANTAN J.C., PAIRIS J.L., COLLETTA B. et al., 1992. Carte géologique de la France à 1/50 000, feuille 702 Annecy-Ugine. Editions BRGM.

EL NEGDI E.L., RIVA E., MORETTI I. and COLLETTA B., 1992. Internal deformation in extensional domains: field evidences from Sinai and western side of Red Sea. In: *11th EGPC Petroleum Exploration and Production Conference*, Cairo, November 7-11 1992, 14 pages.

ROURE F., BRUN J.P., COLLETTA B. and VAN DEN DRIESSCHE J., 1992. Geometry and kinematics of extensional structures in the Alpine Foreland Basin of south-eastern France. *Journal of structural geology*, vol. 14, n°5, p. 503-519

1993

SASSI W., COLLETTA B., BALE P. and PAQUEREAU T., 1993. Modelling of structural complexity in sedimentary basins: the role of pre-existing faults in thrust tectonics. *Tectonophysics*, special issue "The origin of sedimentary basins: inferences from quantitative modelling and basin analysis, vol. 226, n°1/4, p. 97-112.

ROURE F., B. COLLETTA B., 1993, Cenozoic inversion structures in the foreland of the Pyrenees and Alps, Mémoires du Muséum national d'Histoire Naturelle ISSN 1243-4442. vol. 170 (549 p.), pp. 173-209

1994

ROURE F., BRUN J.P., COLLETTA B. and VIALLY R., 1994. Multiphase extensional structures, fault reactivation and petroleum plays in the Alpine Foreland Basin of

Southeastern France. In *"Hydrocarbon and petroleum geology of France"*. A. Mascle Ed., E.A.P.G. Special publication n°4. Paris, Springer-Verlag, p. 245-268.

1995

BABY P., COLLETTA B. et ZUBIETA D., 1995. Etude géométrique et expérimentale d'un bassin transporté : exemple du synclinorium de l'Alto Beni (Andes centrales). *Bulletin de la Société Géologique de France*, vol. 166, n°6, p. 797-811.

COLLETTA B., 1995. Analogue modelling and structural interpretation of seismic data. *Petroleum geoscience*, vol. 1, n°2, p. 151-152.

GUILLIER B., BABY P., COLLETTA B., MENDEZ E., LIMACHI R., LETOUZEY J. and SPECHT M., 1995. Analyse géométrique et cinétique d'un "duplex" issu d'un modèle analogue visualisé en 3D par tomographie aux rayons X. *Comptes Rendus de l'Académie des Sciences, série IIa*, tome 321, n°10, p. 901-908.

LETOUZEY J., COLLETTA B., VIALLY R. and CHERMETTE J.C., 1995. Evolution of salt-related structures in compressional settings. In : *Salt tectonics : a global perspective*. M.P.A. Jackson, D.G. Roberts et S. Snelson Eds. Tulsa, AAPG Memoir n°65, p. 41-60.

1996

BABY P., SPECHT M., OLLER J., MONTEMURRO G., COLLETTA B. and LETOUZEY J., 1996. The Boomerang-Chapare transfer zone (recent oil discovery trend in Bolivia) : structural interpretation and experimental approach. In: *Geodynamic evolution of sedimentary basins*. F. Roure, N. Ellouz, V.S. Shein, I.I. Skvortsov Eds. Editions Technip, p. 203-218.

MOUTHEREAU F., ANGELIER J., DEFFONTAINES B., LACOMBE O., CHU H.T., COLLETTA B. et al., 1996. Cinématique actuelle et récente du front de chaîne de Taiwan. *Comptes Rendus de l'Académie des Sciences de Paris, série II a*, tome 323, p. 713-719.

1997

COLLETTA B., ROURE F., DE TONI B., LOUREIRO D., PASSALACQUA H. and GOU Y., 1997. Tectonic inheritance, crustal architecture and contrasting structural styles in the Venezuela Andes. *Tectonics*, vol. 16 n°5, p. 777-794.

MUGNIER J.L., BABY P., COLLETTA B., VINOURE P., BALE P. and LETURMY P., 1997. Thrust geometry controlled by erosion and sedimentation : a view from analogue models. *Geology*, vol. 25, n°5, p. 427-430.

ROURE F., COLLETTA B., DE TONI B., LOUREIRO D., PASSALACQUA H. and GOU Y., 1997. Within-plate deformations in the Maracaibo and East Zulia basins, western Venezuela. *Marine and petroleum geology*, vol. 14, n°2, p. 139-163.

PHILIPPE Y., B. COLLETTA, E. DEVILLE, and A. MASCLE, 1997, The Jura fold-and-thrust belt a kinematic model based on map-balancing; in Peri-Tethys Memoir 2 : Structure and Prospects of Alpine Basins and Forelands (edited by Ziegler, P.A. & Horvath), Mem. Hist. Nat. 170, 235-261.

1998

SCHREURS G. and B. COLLETTA 1998, Analogue modelling of faulting in zones of continental transpression and transtension, Geological Society, London, Special Publications, January 1, 1998; 135(1): 59 – 79.

1999

COLLETTA B, J LETOUZEY, J SOARES, and M SPECHT, 1999, Detachment versus fault propagation folding: insights from the Sub Andean ranges of Southern Bolivia, Thrust Tectonics abstract volume,

2000

LETURMY P.; MUGNIER J.L.; VINOURE P.; BABY P.; COLLETTA B.; CHABRON E., 2000, Piggyback basin development above a thin-skinned thrust belt with two detachment levels as a function of interactions between tectonic and superficial mass transfer: the case of the Subandean Zone (Bolivia). Tectonophysics, Volume 320, Number 1, pp. 45-67(23)

2006

CORTÈS, M, B. COLLETTA, J. ANGELIER, 2006, Structure and tectonics of the central segment of the Eastern Cordillera of Colombia, Journal of South American Earth Sciences Volume 21, Issue 4, Pages 437-465.

2008

AFFOLTER, T., FAURE, J. L., GRATIER, J. P., & COLLETTA, B. (2008). Kinematic models of deformation at the front of the Alps: new data from map-view restoration. Swiss Journal of Geosciences, 101(2), 289-303.

2011

WILSON H., LUHESHI M.; COLLETTA B., 2011, Detailed play fairway analysis sheds new light on Nova Scotia offshore, Oil & gas journal,109,14.

2012

WILSON, H., M. LUHESHI, D. ROBERT, B. COLLETTA, 2012, A Re-Evaluation of Play Risks and Volumes, Offshore Nova Scotia. AAPG Search and Discovery Article # 50530

WILSON H, M. LUHESHI, D. ROBERTS, B. COLLETTA, 2012, Play Risks and Volumes - Offshore Nova Scotia, Third Central & North Atlantic Conjugate Margins Conference, Trinity College, Dublin, 22-24 August 2012, Abstracts volume. p. 108-113

LUHESHI, M., D. G. ROBERTS, K. NUNN, J. MAKRIS, B. COLLETTA, H WILSON, F. MONNIER, G. RABARY, M. DUBILLE, 2012, The impact of conjugate margins analysis on



play fairway evaluation – an analysis of the hydrocarbon potential of Nova Scotia, first break, volume 30, January 2012, p.61-72.

2016

ROHAIS, S., BARROIS, A., COLLETTA, B. AND MORETTI, I., 2016, Pre-salt to salt stratigraphic architecture in a rift basin: insights from a basin-scale study of the Gulf of Suez (Egypt) Arab J Geosci (2016) 9: 317. doi:10.1007/s12517-016- 2327