Alexandra Guy Ph.D.

37 years (1984) born in Strasbourg, France, French nationality
Czech Tel.: +420 774 373 194
e-mail: alexandra.guy@geology.cz

ORCID research ID: https://orcid.org/0000-0002-6269-9270
WOS research ID: https://publons.com/researcher/G-6036-2014/

Specialities: Geophysics, Geology, Geodynamics

EDUCATION

2012: **PhD. Degree, specialities Geodynamic/Geology/Geophysics** at the University of Strasbourg *"Geological and geophysical characterization of accretionary and collisional systems: the Central Asian Orogenic Belt and the Bohemian Massif",* supervised by K. Schulmann.

2009: **Engineering Diploma (Master's degree)** of Ecole et Observatoire des Sciences de la Terre, University of Strasbourg, France: "*Flexible and target-oriented Prestack Depth Migration tools: a ray-tracing approach"* supervised by I. Lecomte, T. Kaschwich, NORSAR, Lillestroem, Norway.

2008: **Master's degree in Earth Sciences**, at University of Strasbourg.
"Indentation and exhumation processes in the south-western part of the Bohemian Massif: gravity modeling approach", supervised by K. Schulmann, J.B. Edel.

PROFESSIONAL EXPERIENCE

Current position

Since 2013: Research fellow at the Centre for Lithospheric Research hosted by Czech Geological Survey.

Previous position

2012-2013: Teaching and Research assistant (ATER), one year contract at the University of Strasbourg.
2011-2012: Trainee at the department of geosciences technics in AREVA, Paris La Défense.

FIELD EXPERIENCE

14 years of field experience, including Central Asian Orogenic Belt in Mongolia and China, Dronning Maud Land in Antarctica, Finneidfjord in Norway and Piton de la Fournaise in France.

CURRENT RESEARCH INTERESTS

- Geophysical and geological characterization of accretionary and collisional orogenic systems.
- Architecture of continental crust with forward and inverse modeling of gravity and magnetic anomalies.
- Structural geology and tectonics of orogenic systems.

RESEARCH ACTIVITIES: COMMUNICATIONS & DUTIES

- 19 articles in journals with IF (7 as first author), 382 citations, h-index=9 (WOS, 25.6.2021),
- 14 Oral presentations (11 as first author), 15 posters (12 as first author) at international conferences.
- *2017-…* Associate editor, Journal of GEOsciences

PROJECTS & FUNDINGS

Project coordination:

➢ *2015-2016:* "Moho depth model and lithospheric structures from GOCE gravity gradient data for the Central Asian Orogenic Belt". Czech Geological Survey - Institutional grant N°321430.
➢ *2018-2019:* "The subglacial geology of dome F (East Antarctica) determined by new aeromagnetic data". Czech Geological Survey - Institutional grant N°310230.
➢ *2019-2021:* "Crustal and upper-mantle structures from seismic anisotropy analysis and gravity data in Mongolia", PHC Barrande project N°42674XJ, in collaboration with C. Tiberi, Géosciences Montpellier.

Project participation:

➢ *2012-2016:* "Return of the Czech scientists", "The role of Paleozoic accretionary and collisional orogens on the formation and growth of continental crust". Grant of Ministry of Education of the Czech Republic, LK11202 to K. Schulmann.
➢ *2012-2015:* "Crustal growth and construction of continental crust exemplified by Central Asian Orogenic Belt". GAČR, P210/12/2205 to K. Schulmann.

- *2017-2019:* "Contrasting mechanisms of formation of the Pangea supercontinent: new insights into formation of continental crust". GAČR, 17-17540S to K. Schulmann.
- *2019-2023:* "Principal mechanisms of peripheral continental growth during supercontinent cycle". GAČR EXPRO, GX19-27682X to K. Schulmann.

Scholarships:

2016-2017: "Old Ice Reconnaissance" project for two months in Antarctica from the Alfred Wegener Institute, Bremerhaven, Germany, in the frame of the consortium Beyond EPICA – Oldest Ice (BE-OI).

2020: "Operational Program Research, Development and Education, Call No. 02_18_053 for International mobility of researchers" from the Czech ministry of education youth and sports, 3 months at the University of Strasbourg in the department of "Géologie Océans Lithosphère Sédiments".

SUPERVISION OF UNDERGRADUATE STUDENTS

Supervision and co-supervision of 6 Master students from the University of Strasbourg and University of Montpellier: Alexandre Weydmann (2012), Alice Prudhomme (2014), Margot Loubière-Seydoux (2019), Anaïs Lemarchand (2019), Léo Bertin (2020), Roxane Mathey (2021).

PRINCIPAL COLLABORATIONS OF THE LAST 5 YEARS

Czech Geological Survey, Centre for Lithospheric Research (Prof. K. Schulmann, V. Janoušek, P. Hanžl , P. Štípská, I. Soejono); Charles' University, Prague (O. Lexa); Christian Albrecht University, Kiel (Prof. J. Ebbing, N. Holzrichter); Géosciences Montpellier (C. Tiberi); Alfred Wegener Institute, Bremerhaven (G. Eagles); University of Strasbourg (J. Autin, M. Munschy, J.-B. Edel); National History Museum of London (Prof. R. Seltmann, R. Armstrong); Guangzhou Institute of Geochemistry, Chinese Academy of Sciences (Y. Jiang, J. Zhang); MonMap Company (S. Mijiddorj).

PUBLICATIONS

RANK A

Guy, A., K. Schulmann, I. Soejono, N. Holzrichter, O. Lexa and M. Munschy (2021), Structures and Geodynamics of the Mongolian tract of the Central Asian Orogenic Belt constrained by Potential field analyses, invited review Gondwana Research Focus review, 92, 26-53.

Krýza, O., O. Lexa, K. Schulmann, **A. Guy,** D. Gapais, J. Cosgrove, W. Xiao, (2020), Oroclinal buckling and associated lithospheric-scale material flow - insights from physical modelling: Implication for the Mongol-Hingan orocline, Tectonophysics, 800, 228712.

Guy, A., K. Schulmann, I. Soejono, and W. Xiao (2020), Revision of the Chinese Altai-East Junggar Terrane Accretion Model Based on Geophysical and Geological Constraints, Tectonics, 39(4), e2019TC006026.

Hanžl, P., **A. Guy**, A. Battushig, O. Lexa, K. Schulmann, E. Kunceová, K. Hrdličková, V. Janoušek, D. Buriánek, Z. Krejčí, Y. Jiang, D. Otgonbaatar, (2020), Geology of the Gobi and Mongol Altai junction enhanced by gravity analysis: a key for understanding of the Mongolian Altaides, Journal of Maps, 16(2), 98-107.

Broussolle, A., M. Sun, K. Schulmann, **A. Guy**, C. Aguilar, P. Štípská, Y. Jiang, Y. Yu, and W. Xiao (2019), Are the Chinese Altai "terranes" the result of juxtaposition of different crustal levels during Late Devonian and Permian orogenesis?, Gondwana Research, 66, 183-206.

Jiang, Y., K. Schulmann, M. Sun, P. Štípská, **A. Guy**, O. Lexa, V. Janoušek, and C. Yuan (2017), Melting of accretionary wedge and building mature continental crust: Insights from the magmatic evolution of the Chinese altai orogen, central Asia, Geodynamics and Tectonophysics, 8(3), 481-482.

Schulmann, K., M. Sun, O. Lexa, **A. Guy**, V. Janoušek, Y. Jiang, and P. Štípská (2017), Hybrid accretionary/collisional mechanism of Paleozoic Asian continental growth: New plate tectonic perspective, Geodynamics and Tectonophysics, 8(3), 551-552.

Guy, A., N. Holzrichter, and J. Ebbing (2017), Moho depth model for the Central Asian Orogenic Belt from satellite gravity gradients, Journal of Geophysical Research: Solid Earth, 122(9), 7388-7407.

Jiang, Y. D., K. Schulmann, M. Sun, P. Štípská, **A. Guy**, V. Janoušek, O. Lexa, and C. Yuan (2016), Anatexis of accretionary wedge, Pacific-type magmatism, and formation of vertically stratified continental crust in the Altai Orogenic Belt, Tectonics, 35(12), 3095-3118.

Zhang, J., M. Sun, K. Schulmann, G. Zhao, Q. Wu, Y. Jiang, **A. Guy**, and Y. Wang (2015), Distinct deformational history of two contrasting tectonic domains in the Chinese Altai: Their significance in understanding accretionary orogenic process, Journal of Structural Geology, 73, 64-82.

Guy, A., Schulmann, K., Janoušek, V., Štípská, P., Armstrong, R., Belousova, E., Dolgopolova, A., Seltmann, R., Lexa, O., Jiang, Y., Hanžl, P. (2015), Geophysical and geochemical nature of relaminated arc-derived lower crust underneath oceanic domain in southern Mongolia, Tectonics, 34(5), 1030-1053.

Guy, A., K. Schulmann, M. Munschy, J. M. Miehe, J. B. Edel, O. Lexa, and D. Fairhead (2014b), Geophysical constraints for terrane boundaries in southern Mongolia, Journal of Geophysical Research: Solid Earth, 119(10), 7966-7991.

Guy, A., K. Schulmann, N. Clauer, P. Hasalová, R. Seltmann, R. Armstrong, O. Lexa, and A. Benedicto (2014a), Late Paleozoic-Mesozoic tectonic evolution of the Trans-Altai and South Gobi Zones in southern Mongolia based on structural and geochronological data, Gondwana Research, 25(1), 309-337.

Barde-Cabusson, S., Finizola, A., Peltier, A., Chaput, M., Taquet, N., Dumont, S., Duputel, Z., **Guy, A.**, Matthieu, L., Saumet, S., Sorbadère, F., Vieille, M. (2012), Structural control of collapse events inferred by self-potential mapping on the Piton de la Fournaise volcano (La Réunion Island). Journal of Volcanology and Geothermal Research, 209-210, Pages 9-18.

Lexa, O., K. Schulmann, V. Janoušek, P. Štípská, **A. Guy**, and M. Racek (2011), Heat sources and trigger mechanisms of exhumation of HP granulites in Variscan orogenic root, Journal of Metamorphic Geology, 29(1), 79-102.

Guy, A., J. B. Edel, K. Schulmann, C. Tomek, and O. Lexa (2011), A geophysical model of the Variscan orogenic root (Bohemian Massif): Implications for modern collisional orogens, Lithos, 124(1-2), 144-157.

Barde-Cabusson, S., Levieux, G., Lénat, J.-F., Finizola, A., Revil, A., Chaput, M., Dumont, S., Duputel, Z., **Guy, A.**, Matthieu, L., Saumet, S., Sorbadère, F., Vieille, M. (2009), Transient self-potential anomalies associated with recent lava flows at Piton de la Fournaise volcano (Réunion Island, Indian Ocean). Journal of Volcanology and Geothermal Research, Volume 187, Issues 3-4, Pages 158-166.

Lecomte, I., M. Bano, S. E. Hamran, E. Dalsegg, K. M. Nielsen, M. H. Nielsen, G. Douillet, E. Frery, **A. Guy**, and S. Volesky (2008), Submarine slides at Finneidfjord (Norway): Geophysical investigations, paper presented at Environmental and Engineering Geophysical Society - 21st Symposium on the Application of Geophysics to Engineering and Environmental Problems 2008.

GEOSCIENCE RESEARCH REPORTS

Žáček, V., Břízová, E., Bohdálek, P., Buriánek, D., Čáp, P., Enkhjargal, M., Franců, J., Gelegjamts, A., **Guy, A.**, Hanžl, P., Havlíček, P., Henrion, E., Hošek, J., Jelének, J., Knésl, I., Karenová, J., Kociánová, L., Kotková, J., Krejčí, Z., Mixa, P., Mrlina, J., Pecina, V., Pécskay, Z., Prudhomme, A., Soejono, I., Svojtka, M., Šimůnek, Z., Škoda, R., Verner, K., Vondrovic, L., Vorel, T., Vrána, S., Čopjaková, R. (2016b), Geological mapping 1: 50,000 and assessment of economic potential of selected region in Western Mongolia (Mongol Altai 50, Ma-50), Česká geologická služba, Mineral Resources Authority of Mongolia.

INVITED PRESENTATIONS

Guy, A., K. Schulmann, V. Janoušek, P. Štípská, J. Ebbing, N. Holzrichter, M. Munschy, 2017. Structure lithosphérique d'un orogène d'accrétion Paléozoïque : cas de l'Asie Centrale. Géosciences Montpellier, CNRS, May 2017.

Guy, A., T. Binder, 2017. New aeromagnetic data around Dome F, East Antarctica: first results and perspectives, Czech Geological Society, Brno, November 2017.

Guy, A., G. Eagles, T. Binder, N.B. Karlsson, O. Eisen, 2019. Subglacial Geology of the Dome F Region, Dronning Maud Land, East Antarctica: Preliminary results. EGU April 2019.

Conference proceedings

Posters

1. **Guy, A.,** Edel, J.B., Schulmann, K., Lexa, O., 2009. Gravimetric imagery of crustal structure of the Bohemian Massif: new model of structure of crustal root. ***Granulites & Granulites 2009*** conference in Czech Rep.

2. **Guy, A.,** Edel, J.B., Schulmann, K., Tomek, C., Lexa, O., 2010. A geophysical model of lower crustal structure of the Palaezoic crustal root (Bohemian Massif): implications for modern collisional orogens. Geophysical Research Abstracts Vol. 12, EGU2010-13643, 2010. ***EGU General Assembly 2010*** – Vienna.

3. Maierová, P., **Guy, A**., Lexa, O., Čadek, O., 2010. Application of FE software Elmer to the modeling of crustal-scale processes. Geophysical Research Abstracts Vol. 12, EGU2010-13643, 2010. ***EGU General Assembly 2010*** – Vienna.

4. **Guy, A.,** Schulmann, K., Munschy, Marc, 2010. Preliminary interpretations of geophysical data of the Central Asia Orogenic Belt. ***International workshop on Geodynamic Evolution, Tectonics and Magmatism of the Central Asian Orogenic Belt***, Altay 2010 – Novosibirsk.

5. **Guy, A.**, Schulmann, K., Munschy, Marc, Lehmann, J., 2010. Geophysical potential field data interpretations to study continental construction processes of the Central Asia Orogenic Belt, ID: 951024, ***AGU2010***-San Francisco.

6. **Guy, A**., Schulmann, K., Munschy, M., Miehe, J.-M., Edel, J.-B., Lexa, O., Fairhead, D., 2014. Geophysical constraints for terrane boundaries in southern Mongolia, Vol. 16, EGU2014-5179, ***EGU General Assembly 2014*** – Vienna.

7. **Guy, A.**, Ebbing, J., 2014. Preliminary results of a Moho depth model for the Central Asian Orogenic Belt from GOCE satellite gravity data, ***ESA, 5th International GOCE workshop***, UNESCO, Paris.

8. **Guy, A.**, Ebbing, J., Holzrichter, N., 2015. Moho depth model by gravity inversion and gravity gradient forward modelling, ***CETeG Avril 2015*** – Kadaň, République Tchèque.

9. Prudhomme, A., **Guy, A.**, Štípská, A., Hanžl, P., Heimlich, C., Henrion, E., Schulmann, K., Masson, F., 2015. P-T conditions of crustal xenoliths and gravity measurements: Architecture and composition of the crust in an accretionary orogen, Mongolia, ***CETeG Avril 2015*** – Kadaň, République Tchèque.

10. **Guy, A.**, Holzrichter, N., Ebbing, J., 2016. Moho depth model from GOCE gravity gradient data for the Central Asian Orogenic Belt, Vol. 18, EGU2016-5879, ***EGU General Assembly 2016*** – Vienna.

11. **Guy, A.**, Ebbing, J., Holzrichter, N., 2016. Moho depth model from GOCE gravity gradient data for the Central Asian Orogenic Belt, ***Living Planet Symposium, European Spatial Agency 2016*** – Prague.

12. **Guy, A.**, Holzrichter, N., Ebbing, J., 2018. Moho topography and lithospheric gravity anomalies for the Central Asian Orogenic Belt from satellite gravity gradients, Vol. 20, EGU2018-7891, ***EGU General Assembly 2018*** – Vienna.

13. **Guy, A.**, Graeme, E., Binder, T., Karlsson, N., Eisen, O., 2019. Subglacial geology and tectonics of the Dome F, Dronning Maud Land, East Antarctica: preliminary results, Vol. 21, EGU2019-7187, ***EGU General Assembly 2019*** – Vienna.

14. Loubière, M., **Guy, A.**, Munschy, M., Schulmann, K., 2019. Geophysical constraints for suture zones in the Precambrian blocks of the Mongolian collage, Central Asian Orogenic Belt, ***CETeG 2019***, Brno, Czech Republic.

15. **Guy, A.**, Schulmann, K., Holzrichter, N., Ebbing, J., Munschy, M., 2019. Multiscale geophysical characterization of the Central Asian Orogenic Belt: Case study of southern Mongolia, ***IGCP 662***, Ulaanbaatar, Mongolia.

Oral Presentations

1. **Guy, A.**, Edel, J.B., Schulmann, K., Munschy, M., Lexa, O., 2010. Consequences of subduction: ->Significance of a felsic lower crust in orogenic context (Bohemian Massif) ->Formation of accretionary orogen in the Central Asian Orogenic Belt. ***C2c annual meeting***, Trondheim, Norway.

2. **Guy, A.**, Schulmann, K., Munschy, M., Edel, J.B., Miehe, J.M., Lexa, O., 2013. Gravity and magnetic features of southern Mongolia combined with surface geology: a review of terrane boundaries. ***CETeG 2013***, Czech Republic.

3. **Guy, A.**, Schulmann, K., Janoušek, V., Armstrong, R., Dolgopolova, A., Seltmann, R., Lexa, O., 2014. Deep crustal structure in southern Mongolia inferred from geophysical and geochemical data, ***RST 2014***, Pau, France, sciencesconf.org:rst2014-pau:41028

4. **Guy, A.**, Schulmann, K., Janoušek, V., Štípská, P., Armstrong, R., Belousova, E., Dolgopolova, A., Seltmann, R., Lexa, O., Jiang, Y., Hanžl, P., 2015. Geophysical and geochemical nature of relaminated arc-derived lower crust underneath oceanic domain in southern Mongolia. ***CETeG 2015***, Czech Republic.

5. Jiang, Y., Štípská, P., Sun, M., Schulmann, K., **Guy, A.**, Lexa, O., 2015. Petrogenesis of the Paleozoic synorogenic granitoids in the southern Altai Orogenic Belt, central Asia: new insights into the crustal evolution of accretionary orogenic system. ***CETeG 2015***, Czech Republic.

6. Krýza, O., Lexa O., Schulmann, K., Gapais, D., **Guy, A.**, Cosgrove, J., 2015. Oroclinal buckling and associated material flow under laboratory conditions. ***CETeG 2015***, Czech Republic.

7. **Guy, A.**, Schulmann, K., Janoušek, V., Štípská, P., Armstrong, R., Belousova, E., Dolgopolova, A., Seltmann, R., Lexa, O., Jiang, Y., Hanžl, P., 2016. Geophysical and geochemical nature of relaminated arc-derived lower crust underneath oceanic domain in southern Mongolia. Vol. 18, EGU2016-5849, ***EGU General Assembly 2016*** – Vienna.

8. **Guy, A.**, Schulmann, K., Holzrichter, N., Ebbing, J., Munschy, M., 2018. Potential field data in understanding the construction of the Pangea supercontinent: outcomes and challenges on the Central Asian Orogenic Belt, Vol. 20, EGU2018-7859, ***EGU General Assembly 2018*** – Vienna.

9. **Guy, A.**, Schulmann, K., Holzrichter, N., Ebbing, J., Munschy, M., Xiao, W., 2018. Potential field data analysis in understanding the construction of the Central Asian Orogenic Belt, ***CRUSTAMAN, 2018***, Třeboň, Czech Republic.

10. **Guy, A.**, Schulmann, K., Xiao, W., 2019. Geophysical constraints for the tectonic reconstruction of the Chinese Altai and the Junggar tectonic zones, Vol. 21, EGU2019-14337, ***EGU General Assembly 2019*** – Vienna.

11. **Guy, A.**, Schulmann, K., Xiao, W., 2019. Geophysical constraints for the tectonic reconstruction of the Chinese Altai and the eastern Junggar boundary, ***CETeG 2019***, Brno, Czech Republic.

12. **Guy, A.**, Eagles G., Eisen O., 2020. Subglacial geology and tectonics of the Dome F Region, Dronning Maud Land, East Antarctica, **AGU 2020 online**.

13. **Guy, A.**, Tiberi C., Mijiddorj S., 2021. Crustal structures of southern Mongolia from seismic anisotropy and gravity analysis, **EGU General Assembly 2021**, online, 19–30 Apr 2021, EGU21-867, https://doi.org/10.5194/egusphere-egu21-867.

14. Holzrichter, N., **Guy A.**, Ebbing J., 2021. Predict depth constraints for lithospheric modelling by machine learning, **EGU General Assembly 2021**, online, 19–30 Apr 2021, EGU21-2921, https://doi.org/10.5194/egusphere-egu21-2921.

FIELD EXPERIENCES

Summer 2019: **Western Mongolia** (5 weeks). Structural geology, tectonic, cartography, sampling for datation, petrological analysis.

Dec 2016-Feb 2017: **Dronning Maud Land, East Antarctica, Dome Fuji** (2 months). OIR (Oldest Ice Reconnaissance) airborne magnetic survey.

Summer 2015: **Mongol Altaï, Mongolia** (5 weeks). Structural geology, tectonic, cartography, sampling for datation, petrological analysis.

Summer 2014: **Mongol Altaï, Mongolia** (6 weeks). Gravity measurements.

Summer 2011: **Chinese Altaï, China** (5 weeks). Structural geology, tectonic, cartography, sampling for datation, petrological analysis.

Summer 2010: **Gorny Altaï, Russia** (1 week). International workshop on Geodynamic Evolution, Tectonics and Magmatism of the Central Asian Orogenic Belt

Summer 2009: **Bohemian Massif, Czech Rep. (10 jours).** *Petrological and structural study of HP rocks.* Structurale analysis, tectonic, cartography, petrology.
Variscan orogeny in Corsica and Sardinia, France and Italy (1 week). Structural and petrological study of key outcrops along north-south transect in the frame of Master 2 student field trip.

Summer 2008: **Gobi desert, Mongolia** (2 months)**.** *Tectonic evolution of Trans-Altaï & South Gobi zones in southern Mongolia.* Structural geology, tectonic, cartography, sampling for datation, petrological analysis.

Summer 2007: **Finneidfjord, Norvège** (10 days). *Submarine slides at Finneidfjord (Norway): Geophysical investigations.*Georadar and other radar methods, seismic reflection, passive seismic, electrical methods.

Summer 2006: **Piton de la Fournaise, Ile de la Réunion, France** (1 mois). *Thermical and hydrological flux in the slopes of Piton de la Fournaise with self potential measurements and study of seismic crisis at the observatoire volcanologique de la Réunion.* Volcanic geology and petrology, seismogram analysis, SP measurements and treatments.

TEACHING EXPERIENCES (2009-2013)

Structural Geology: 2nd year of Licence degree
Cartography: 2nd year of Licence degree
Geological and geophysical field trip: 2nd and 3rd year of Licence degree and 2nd year of Master degree
Geosciences: 1st year of Licence degree
Rheology of the lithosphere: 1st year of Master degree
Linear Algebra: 1st year of Licence degree

COMPUTER SKILLS

Treatment and modeling of potential field: Geosoft Oasismontaj, Surfer, IGMAS+, LithoFLEX
Geographic Information System: ArcGIS, Global Mapper
Modeling and seismic imagery: NORSAR 2D, NORSAR 3D, SeisRoX
Graphic software: Adobe Illustrator, Indesign, Inkscape
Microsoft Office: Word, Excel, Access, PowerPoint
Basic knowledge in: Seismic Unix, Matlab, C Programming language.

LANGUAGES

French: Native speaker.
English: Good working knowledge.
German: Scholar knowledge.
Czech: Basic knowledge.

OTHERS SKILLS

Driver licence.
AFPS (Attestation de Formation aux Premiers Secours) licence.
BAFA (Brevet d'Aptitude aux Fonctions d'Animateur) licence.

Pastimes: walking and trekking (e.g. GR20 in 2010, GR5 in 2013)/skiing, swimming, badminton (double), drawing and painting.