

Curriculum Vitae - Mihai N. Ducea

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1. Education

California Institute of Technology, Ph.D. (Geology), 1999

Advisor: Prof. Jason Saleeby

California Institute of Technology, M.S. (Geology), 1995

Advisors: Prof. Jason Saleeby and Prof. Peter Wyllie

University of Bucharest, Romania, Diploma of Geology Engineer, 1991

Advisor: Prof. Marin Seclaman and Prof. Emil Constantinescu

2. Professional Experience

Adjunct (courtesy) Research Scientist, University of Bucharest, Romania (11/11- present)

Professor, Department of Geosciences, University of Arizona (09/09-present)

Associate Professor, Department of Geosciences, University of Arizona (04/04-09/09)

Assistant Professor, Department of Geosciences, University of Arizona (1/01-04/04)

Postdoctoral Scholar, Caltech and Florida International University (10/98-12/00)

Graduate Student, California Institute of Technology (4/94-9/98)

Graduate Student, Department of Geology, Duke University (6/92-3/94)

Teaching Assistant, University of Bucharest (9/91-3/92)

3. Research

Summary: I am a tectonic petrologist, focusing on a variety of problems from subduction related (magmatism, subduction erosion, delamination) to extension and collision of the continents. I investigate mineral evolution, cyclicity of orogens, sutures, transform faults, and metamorphism in collisional belts among others. Regions of interest are the western North American Cordillera, the central Andes, the Pamirs, the Carpathians and Balkan Mountains, mainland Asia from Mongolia to Tibet, and others. At Univ. Arizona I oversee a trace elemental geochemical + radiogenic isotopic (TIMS) facility. With students and collaborators, I wrote about 160 peer reviewed papers including journal papers and chapters in books. I collaborate with over 800 co-authors from 27 countries. My H-index is 42 in WOS, 44 in Scopus and 52 -Google Scholar. I have around 8900 citations in Google Scholar and around 6000 in WOS in about 21 (close to 22) years post PhD. I strive to keep an (H index)/(number of years post PhD) of 2 (Web of Science) or above (Scopus, Scholar). My papers range from regional geology to technique development, global data analysis and exploring new concepts in tectonic research. I collaborate with geophysicists, climate change scientists, archeologists, paleontologists, as the publication record shows. I purposely have maintained a wide range of interests in Earth Sciences from my early career on in an effort to have a broad handle on geologic problems. This should be evident in my publication record ranging from regional geology and recognition of fault systems to development of better isotopic techniques, from crustal evolution studies based on zircon petrochronology to carbonate subduction, from arc tempos to delamination of arc roots, etc.

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My research so far was centered on ten major topics in petrology, geochemistry and field geology:

1. Crust mantle exchange at subduction systems. I study exposed arc lower crustal sections at various locations in order to quantify the exchange between crust and mantle via magmatism and foundering. My PhD thesis has the first to document igneous cumulate and residues as eclogite facies rocks under arcs (known today as *arclogites*) and the hypothesis of arc root foundering under thick continental arcs.

2. Fluxes and tempos of arc magmatism. We use granitoid geochronology and field constraints to quantify regional and global fluxes of magmas in arcs and find causes for the non-steady state behavior of arcs.

3. Regional geology. I contribute to regional geology studies (most recently in the Carpathians) via geologic mapping and geochronology and thermochronology with a particular focus on basement terrains.

4. Sm-Nd, Rb-Sr and other geochronology applied to igneous and metamorphic rocks. I oversee a TIMS and ICP-MS laboratory where we push the envelope of various geochronologic techniques, with a focus on metamorphic geochronology.

5. Ultra shallow subduction. We study the field evidence for underplating mechanisms and their consequences for convergent margin evolution. The focus so far was on Western North America and Mexico.

6. Crustal and mantle xenoliths. I have a long-term interest in using xenoliths as tectonic tracers of lithospheric composition and evolution.

7. Mineral evolution. We study the linkages between tectonic processes in a Wilson cycle and the distribution of mineral species on continental regions.

8. Geophysics and petrology of deep arcs. I am invested in collaboration with geophysics groups (seismologists and other geophysicists) to decipher the composition and extent of magma bodies under subduction systems.

9. Basalt petrology. We use the geochemistry of basalts from various regions to test for magnitude of extension, provide tests of delamination and other tectonic processes in various continental regions.

10. Geochemistry and crustal thickness over time. We use intermediate rock trace elemental geochemistry and that of derivative trace minerals (zircon, apatite) to quantify crustal thickness evolution over time in orogenic regions.

4. Teaching/advising

Summary: My teaching duties and interests span the undergraduate and graduate curriculum and also include shorter topical seminars for the most advanced scholar. Most of my teaching activities are performed at University of Arizona, although I did teach shorter modules and more advanced course at other Universities (China University of Geosciences, University of Concepcion, University of Bucharest and UBB Cluj). I have a series of short courses on geochronology, geochemistry and other novel developments of use to the oil and gas industries. They have been presented in short modules at Chevron, OMV, Ecopetrol and other large corporations. Most recurrent class I teach for U Arizona is Undergraduate Petrology (Igneous and Metamorphic). I am in the final stages of completing a Petrology textbook (Ducea and Sen, Springer, 2020 or 2021), which used to be Sen (2014) in its first edition. It is a new way of looking at petrology, with

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limited phase diagrams and a more comprehensive geochemical approach and a tectonic framework for understanding melting and metamorphism.

Courses taught:

- Petrology (undergraduate)
- Field Camp (undergraduate)
- Physical Geology (undergraduate)
- Structural Geology (undergraduate)
- Geochronology/thermochronology (undergrad/grad)
- Tectonic Petrology (graduate course)
- Regional Tectonics (graduate course)
- Chemical evolution of the Earth (new graduate course for 2021)
- Hot Spots (graduate course or seminar)
- Alpine and Carpathian geology (grad seminar)

Outstanding students and postdocs: Undergraduates: Thereza Kayzar, Guleed Ali, Jordan Krcmaric, Derek Hoffman. Graduate students: Steven Kidder, David Barbeau, Christian Manthei, David Pearson, Mary Robinson Cecil, Jay Chapman, Kendra Murray, Lucia Profeta, Fangyang Hu, Emily Bowman, Anca Barla. Postdocs: Alexander Robinson, Alan Chapman, Paul Wetmore, Antoine Triantafyllou, Constantin Balica, Lyung Zhang, Fuhao Xiong, Yunchuan Zeng.

5. Honors & Awards

Koons Graduate Fellowship, 1998

GSA fellow, 2016

Dida Scholar, China University of Geosciences, Wuhan, 2016-2019

Fulbright Scholar, 2017-2018

6. Scholarly Presentations (past 5 years)

Oregon State University, Istanbul Technical University, China University of Geosciences Wuhan, China University of Geosciences Beijing, University of Oslo, Babes Bolyai University of Cluj Napoca, University of Bucharest, University of Liege, University of Brussels,

Keynote talk GSA Phoenix 2019

Invited talk at the Annual Goldschmidt Conference, August, 2015, Prague

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Keynote Speaker GSA Indianapolis 2018

7. Service/Outreach

Summary: I have served on numerous departmental committees at Arizona, as well as for the GSA and AGU. I serve on departmental committees at U Arizona and occasionally at U Bucharest. I am now helping the U Bucharest organize a new research structure (iCUB) and was asked to lead the Earth and Life Science division for a 2-year term, while I will be on sabbatical for the 2020-2021 academic year. I am a chief editor for GSA Today and serve on the publication committee at GSA. I am providing countless reviews for journals and funding agencies throughout the world (USA, China, Hong Kong, Poland, Ukraine, Chile, Argentina, Romania – these only for the past year, 2019). Major community service efforts are currently focused on giving talk on the nature and significance of Earth Sciences to high-schools in Arizona and Romania. I am also heavily invested in helping the Romanian academic community grow internationally competitive in STEM and since 2013 have served on panels and committees at various University levels (U Bucharest and U Cluj) as well as at the National Ministry of Education and Research.

Highlights (top 10) of my service/synergistic activities (past 5 years):

1. Serving on numerous departmental committees (Performance Evaluation, Graduate Policy, Various Hiring Committees, Promotion and Tenure, Field Camp);
2. Working with National Association of Geosciences Teachers (field trips, mini-courses);
3. Contributions to development of NSF Earthscope's GEOFRAME initiative;
4. Organizing and chairing several GSA, AGU and Goldschmidt topical sessions to highlight new avenues in Petrology and Tectonics research;
5. Serving on publication committee at GSA (and co-chaired it in 2019)
6. Co-Edited a GSA Memoir volume: DeCelles, P.G., Ducea, M.N., Carrapa B., and Kapp, P. (editors), "Geodynamics of a Cordilleran Orogenic System: The Central Andes of Argentina and Northern Chile", Geological Society of America Memoir, 2015;
7. Co-Edited volume on "Tethysides in Central and Eastern Europe", with Celal Sengor, Hans Thybo and Oguz Goguz, in press, 2020, Tectonics;
8. Director (Pro-bono) of the Earth Science Division of the Research Institute of the University of Bucharest; iCUB, 2020-2021
9. National Science Foundation Panelist (GEOPRISMS, Petrology, Tectonics);
10. Finalist of NSF Idea Machine competition for developing new programs at NSF (With collaborators Barbara Carrapa and Mihai Surdeanu, U Arizona), with an Artificial Intelligence in Geoscience project, 2019.

Current Editorial Services

Tectonics, Associate Editor (2018 -present);
International Geology Review, Associate Editor (2016 – 2021),
GSA Today, Chief Editor (2018-2021)

Numbers of Manuscripts and Proposals Reviewed

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425 manuscripts reviewed between 2000-2019 (e.g. Nature, Tectonics, J Petrology, Geology, JGR, GSA Bull, Contributions to Mineralogy and Petrology, etc.);
227 proposals reviewed between 2000-2019 (for NSF, PRF, and other national and international organizations).

8. *Funding*

In my 19 years as a faculty member at University Arizona and more recently as a courtesy researcher at University of Bucharest, I have successfully secured research grants and industry contracts as a principal investigator and co-principal investigator. A complete list of grants, contracts and service contracts (laboratory work for third party contractors) is available on request. I do not keep a detailed financial evidence of these, but the University of Arizona and the University of Bucharest do. Below, I provide a list of some of the most important grants in my career development.

US Federal and Private competitive funding:

- Rare earth elements tracing crustal evolution through time: a detrital zircon study - NSF-Tectonics, 07/2017-06/2020
- Constraints on Plateau Architecture and Assembly From Deep Crustal Xenoliths, Northern Altiplano (Southern Peru), Program: NSF Petrology-Geochemistry, 07/01/15-6/30/17.
- Crustal Overturn in Continental Margin Arcs During Magmatic Surges NSF Tectonics, 06/01/2011-5/31/2014
- Collaborative Research: The suturing process: Insight from the India-Asia collision zone NSF Continental Dynamics, University of Arizona, 04/01/11 – 03/30/15 (CO-PI)
- In Pursuit of missing Andean Lithosphere: constraining Late Cenozoic crust-mantle process in the Puna Plateau, central Andes NSF Tectonics, 9/1/09 – 8/31/12
- Collaborative Research: CAUGHT: Central Andean Uplift and the Geodynamics of High Topography NSF Continental Dynamics, 6/1/09 – 5/31/13
- Collaborative Research: Lithospheric removal: The Sierra Nevada as the prototype of a fundamental process in mountain building NSF Continental Dynamics, 6/1/06 – 5/31/10
- Facility Support: Completing the Western North American Volcanic and Intrusive Rock Database (NAVDAT) NSF Instrumentation-Facilities, Facilities support, 9/1/06-8/31/08
- Collaborative Research: BATHOLITHS: Generation and evolution of crust in continental magmatic arcs; National Science Foundation (Continental Dynamics Program), 1/04-1/09

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- Igniting Continental Arcs; A Petrologic Study of Peridotites And Mafic Rocks From The Coast Ridge Belt, Santa Lucia Mountains (California), National Science Foundation (Petrology-Geochemistry Program), 01/2003-12/2005

- Testing the degree of correspondence between surface tectonic features and upper mantle structure and composition by study of volcanic-hosted xenoliths in the southwestern Cordillera National Science Foundation (Tectonics Program), 01/ 2001-12/2002

- Sm-Nd thermochronology of garnets in metamorphic rocks: A new method and tectonic application National Science Foundation (Petrology Program), 01/2001-12/2002

- Collaborative Research: Laboratory and field studies linking electrical anisotropy and deformation in the mantle National Science Foundation (Geophysics Program), 9/2000-8/2001

- K-Ca Geochronology; New Analytical Developments Using Multicollector ICP-MS And Geologic Applications, American Chemical Society, Petroleum Research Fund, 9/2006- 8/2009

- In-Situ U-Pb Age Determinations Using Multiple-Collector ICP Mass Spectrometry: Further Technique Developments and a Tectonic Application, American Chemical Society, Petroleum Research Fund, 9/2002-8/2004

In Romania, Federal Funding (UEFISCDI):

-CUTE New Methods for Tracking Regional and Global Crustal Changes Using the Geochemical Record of Magmatic Rocks and Their Derivative Sediments, UEFISCDI, PCCF, 11/18-11/22.

- DRIPS - Geochemical Tests Of Lithospheric Delamination With Applications To Convergent Margin Tectonics, UEFISCDI, Project PCCE, 6/17-12/19.

Representative industry contracts:

Isotopic techniques constrain the evolution of oil genesis in carbonate reservoirs, Chevron Energy Technology, (2010-2016)

Isotope techniques for cocoa source tracing: Mars Chocolate Company (2015-2018)

OMV-Petrom (2013-2014), The origin of Carpathian terranes.

9. Publications

Abstracts -over 270- are not listed here. Students and postdocs are shown in italics.

Chapters in Scholarly Books and Monographs

- B1. Ducea, M.N., and Saleeby, J.B., A case of delamination of the deep batholithic crust beneath the Sierra Nevada, California, in Ernst, W.G. and Nelson, C.A. (editors), *Integrated Earth and Environmental Evolution of the Southwestern United States*, p. 273-288, 1998.
- B2. Dickinson, W.R., Ducea, M.N., Rosenberg, L., Greene H.G., Graham, S., Clark, J., Weber, G.E., *Kidder, S.*, Ernst, W.G., Tectonic relations and net dextral slip, late Neogene San Gregorio-Hosgri fault zone, coastal California, *GSA Special Paper*, v. 391, 43 pages, 2005.
- B3. Saleeby, J.B., Ducea, M.N., Busby, C.J., Nadin, E.S., and Wetmore, P.H., Chronology of pluton emplacement and regional deformation in the southern Sierra Nevada Batholith, California: Geological Society of America, *Special Paper*, v. 438 doi: 10.1130/2008.2438 (14), 397-427, 2008.
- B4. Ducea, M.N., *Kayzar, T.*, and *Wetmore, P.*, High Precision $^{87}\text{Sr}/^{86}\text{Sr}$ Analyses Using Multi Collector ICP-MS, in *Mineralogy and Geodiversity*, Anastasiu, N. (editor), Romanian Academy of Sciences Special Volume, p. 151-160, 2010.
- B5. *Wetmore, P.H.*, Hughes, S., Stremtam, C., Ducea, M.N., The tectonic implications of post-contractonal magmatism of the Alisitos arc segment of the Peninsular Ranges, Baja California, Mexico, *Geological Society of America Special Paper*, v. 211, p. 669-690, 2014.
- B6. Becker, T., Summa, L., and Ducea, M.N., Temporal growth of the Puna plateau and its bearing on the formation 1 of the Metan foreland basin, northwest Argentina, in DeCelles, P.G., Ducea, M.N., Carrapa B., and Kapp, P., (editors), “Geodynamics of a Cordilleran Orogenic System: The Central Andes of Argentina and Northern Chile”, *Geological Society of America Memoir*, v. 212, p. 407-434, 2015.
- B7. Ducea, M.N., Otamendi, J., Bergantz G.W., Jianu. D., Petrescu, L., Constraints on the origin of the Ordovician Fa matinian-Puna Arc, in DeCelles, P.G., Ducea, M.N., Carrapa B., and Kapp, P., (editors), “Geodynamics of a Cordilleran Orogenic System: The Central Andes of Argentina and Northern Chile”, *Geological Society of America Memoir*, vol. 212, p. 125-139, 2015.
- B8. *Murray, K.E.*, Ducea, M.N., Schoenbohm, L., Mafic lavas on the Puna plateau sample the diverse lithospheric architecture of the long-lived central Andean orogeny, in DeCelles, P.G., Ducea, M.N., Carrapa B., and Kapp, P., (editors), “Geodynamics of a Cordilleran Orogenic System: The Central Andes of Argentina and Northern Chile”, *Geological Society of America Memoir*, v. 212, p. 139-166, 2015.
- B9. De Celles, P.G., Zandt, G., Beck, SL, Currie, C., Ducea, M.N., Carrapa, B., Reiners, P.W., Quade, J., Kapp, P., and Gehrels, G.E., Cyclical Orogenic Processes in the Central Andes, in DeCelles, P.G., Ducea, M.N., Carrapa B., and Kapp, P. (editors), “Geodynamics of a Cordilleran Orogenic System: The Central Andes of Argentina and Northern Chile”, *Geological Society of America Memoir*, v. 212, p. 459-490, 2015.
- B10. Currie, C., Ducea, M.N., and DeCelles, P.G., Geodynamic models of Cordilleran orogens: Gravitational instability of magmatic arc roots, in DeCelles, P.G., Ducea, M.N., Carrapa B., and Kapp, P. (editors), “Geodynamics of a Cordilleran Orogenic System: The Central Andes of Argentina and Northern Chile”, *Geological Society of America Memoir*, 212, p. 1-22; 2015

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Refereed publications

1. Park, S.K., Clayton, R.W., Ducea, M.N., Wernicke, B., Jones, C.H., Ruppert, S.D., 1995. Project combines seismic and magnetotelluric surveying to address the Sierran root question. *Eos, Transactions American Geophysical Union* 76, 297-298.
2. Wernicke, B., Clayton, R., Ducea, M., Jones, C.H., Park, S., Ruppert, S., Saleeby, J., Snow, J.K., Squires, L., Flidner, M., 1996. Origin of high mountains in the continents: The southern Sierra Nevada. *Science* 271, 190-193.
3. Ducea, M.N., Saleeby, J.B., 1996. Buoyancy sources for a large, unrooted mountain range, the Sierra Nevada, California: Evidence from xenolith thermobarometry. *Journal of Geophysical Research: Solid Earth* 101, 8229-8244.
4. Ducea, M.N., Saleeby, J.B., 1998. The age and origin of a thick mafic-ultramafic keel from beneath the Sierra Nevada batholith. *Contributions to Mineralogy and Petrology* 133, 169-185.
5. Ducea, M., Saleeby, J., 1998. A case for delamination of the deep batholithic crust beneath the Sierra Nevada, California. *International Geology Review* 40, 78-93.
6. Ducea, M., Saleeby, J., 1998. Crustal recycling beneath continental arcs: silica-rich glass inclusions in ultramafic xenoliths from the Sierra Nevada, California. *Earth and Planetary Science Letters* 156, 101-116.
7. Gao, S., Ducea, M.N., Zhenmin, J., Saleeby, J., 1998. Lower crustal delamination and evolution of continental crust. *Geological Journal of China Universities* 4, 241-249.
8. Ducea, M.N., McInnes, B.I.A., Wyllie, P.J., 1999. Experimental determination of compositional dependence of hydrous silicate melts on sulfate solubility. *European Journal of Mineralogy-Ohne Beihefte* 11, 33-44.
9. Ducea, M., 1999. 1.57-Ga magmatism in the South Carpathians: implications for the pre-Alpine basement and evolution of the mantle under the European continent: a discussion. *The Journal of Geology* 107, 733-736.
10. Ducea, M.N., Park, S.K., 2000. Enhanced mantle conductivity from sulfide minerals, southern Sierra Nevada, California. *Geophysical Research Letters* 27, 2405-2408.
11. Ducea, M., 2001. The California arc: Thick granitic batholiths, eclogitic residues, lithospheric-scale thrusting, and magmatic flare-ups. *GSA today* 11, 4-10.
12. Ducea, M., Sen, G., Eiler, J., *Fimbres, J.*, 2002. Melt depletion and subsequent metasomatism in the shallow mantle beneath Koolau volcano, Oahu (Hawaii). *Geochemistry, Geophysics, Geosystems* 3, doi:10.1029/2001GC000184.

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13. Ducea, M.N., 2002. Constraints on the bulk composition and root foundering rates of continental arcs: A California arc perspective. *Journal of Geophysical Research: Solid Earth* 107, doi:10.1029/2001JB000643.
14. Ducea, M., House, M.A., Kidder, S., 2003. Late Cenozoic denudation and uplift rates in the Santa Lucia Mountains, California. *Geology* 31, 139-142.
15. Ducea, M.N., Kidder, S., Zandt, G., 2003. Arc composition at mid-crustal depths: Insights from the Coast Ridge Belt, Santa Lucia Mountains, California. *Geophysical Research Letters* 30, doi:10.1029/2002GL016297.
16. Ducea, M.N., Ganguly, J., *Rosenberg, E.J.*, Patchett, P.J., Cheng, W., Isachsen, C., 2003. Sm–Nd dating of spatially controlled domains of garnet single crystals: a new method of high-temperature thermochronology. *Earth and Planetary Science Letters* 213, 31-42.
17. Ducea, M.N., Lutkov, V., Minaev, V.T., Hacker, B., Ratschbacher, L., *Luffi, P.*, Schwab, M., Gehrels, G.E., McWilliams, M., Vervoort, J., 2003. Building the Pamirs: The view from the underside. *Geology* 31, 849-852.
18. *Kidder, S.*, Ducea, M., Gehrels, G., Patchett, P.J., Vervoort, J., 2003. Tectonic and magmatic development of the Salinian Coast Ridge belt, California. *Tectonics* 22, doi:10.1029/2002TC001409.
19. Medaris Jr, G., Ducea, M., Ghent, E., Iancu, V., 2003. Conditions and timing of high-pressure Variscan metamorphism in the South Carpathians, Romania. *Lithos* 70, 141-161.
20. Park, S.K., Ducea, M.N., 2003. Can in situ measurements of mantle electrical conductivity be used to infer properties of partial melts? *Journal of Geophysical Research: Solid Earth* 108, doi:10.1029/2002JB001899.
21. Saleeby, J., Ducea, M., Clemens-Knott, D., 2003. Production and loss of high-density batholithic root, southern Sierra Nevada, California. *Tectonics* 22, doi:10.1029/2002TC001374.
22. Sen, G., Yang, H.-J., Ducea, M., 2003. Anomalous isotopes and trace element zoning in plagioclase peridotite xenoliths of Oahu (Hawaii): implications for the Hawaiian plume. *Earth and Planetary Science Letters* 207, 23-38.
23. Ducea, M.N., Gehrels, G.E., *Shoemaker, S.*, Ruiz, J., *Valencia, V.A.*, 2004. Geologic evolution of the Xolapa Complex, southern Mexico: Evidence from U-Pb zircon geochronology. *Geological Society of America Bulletin* 116, 1016-1025.
24. Ducea, M.N., *Valencia, V.A.*, *Shoemaker, S.*, Reinders, P.W., DeCelles, P.G., Campa, M.F., Moran-Zenteno, D., Ruiz, J., 2004. Geodesy and Gravity/Tectonophysics-B09404-Rates of sediment recycling beneath the Acapulco trench: Constraints from (U-Th)/He

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- thermochronology. *Journal of Geophysical Research-Part B-Solid Earth* 109, doi:10.1029/2004JB003112.
25. Zandt, G., Gilbert, H., Owens, T.J., Ducea, M., Saleeby, J., Jones, C.H., 2004. Active foundering of a continental arc root beneath the southern Sierra Nevada in California. *Nature* 431, 41-46.
 26. *Barbeau Jr, D.L.*, Ducea, M.N., Gehrels, G.E., Kidder, S., Wetmore, P.H., Saleeby, J.B., 2005. U-Pb detrital-zircon geochronology of northern Salinian basement and cover rocks. *Geological Society of America Bulletin* 117, 466-481.
 27. Ducea, M.N., Saleeby, J., Morrison, J., *Valencia, V.A.*, 2005. Subducted carbonates, metasomatism of mantle wedges, and possible connections to diamond formation: an example from California. *American Mineralogist* 90, 864-870.
 28. Hacker, B., *Luffi, P.*, Lutkov, V., Minaev, V., Ratschbacher, L., Plank, T., Ducea, M., Patiño-Douce, A., McWilliams, M., Metcalf, J.I.M., 2005. Near-ultrahigh pressure processing of continental crust: Miocene crustal xenoliths from the Pamir. *Journal of Petrology* 46, 1661-1687.
 29. Root, D.B., Hacker, B.R., Gans, P.B., Ducea, M.N., Eide, E.A., Mosenfelder, J.L., 2005. Discrete ultrahigh-pressure domains in the Western Gneiss Region, Norway: implications for formation and exhumation. *Journal of Metamorphic Geology* 23, 45-61.
 30. *Valencia, V.A.*, Ruiz, J., Barra, F., Geherls, G., Ducea, M., Titley, S.R., Ochoa-Landín, L., 2005. U–Pb zircon and Re–Os molybdenite geochronology from La Caridad porphyry copper deposit: insights for the duration of magmatism and mineralization in the Nacozari District, Sonora, Mexico. *Mineralium Deposita* 40, 175-191.
 31. Zeng, L., Saleeby, J.B., Ducea, M., 2005. Geochemical characteristics of crustal anatexis during the formation of migmatite at the Southern Sierra Nevada, California. *Contributions to Mineralogy and Petrology* 150, 386-402.
 32. Brady, R.J., Ducea, M.N., *Kidder, S.B.*, Saleeby, J.B., 2006. The distribution of radiogenic heat production as a function of depth in the Sierra Nevada Batholith, California. *Lithos* 86, 229-244.
 33. *Cecil, M.R.*, Ducea, M.N., Reiners, P.W., Chase, C.G., 2006. Cenozoic exhumation of the northern Sierra Nevada, California, from (U-Th)/He thermochronology. *Geological Society of America Bulletin* 118, 1481-1488.
 34. Ducea, M.N., Gehrels, G.E., *Shoemaker, S.*, Ruiz, J., *Valencia, V.A.*, 2006. Geologic evolution of the Xolapa Complex, southern Mexico: Evidence from U-Pb zircon geochronology: Reply. *Geological Society of America Bulletin* 118, 766-767.

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35. *Kidder, S.*, Ducea, M.N., 2006. High temperatures and inverted metamorphism in the schist of Sierra de Salinas, California. *Earth and Planetary Science Letters* 241, 422-437.
36. *Wagner, L.S.*, Beck, S., Zandt, G., Ducea, M.N., 2006. Depleted lithosphere, cold, trapped asthenosphere, and frozen melt puddles above the flat slab in central Chile and Argentina. *Earth and Planetary Science Letters* 245, 289-301.
37. Ducea, M.N., Barton, M.D., 2007. Igniting flare-up events in Cordilleran arcs. *Geology* 35, 1047-1050.
38. Horodyskyj, U.N., Lee, C.-T.A., Ducea, M.N., 2007. Similarities between Archean high MgO eclogites and Phanerozoic arc-eclogite cumulates and the role of arcs in Archean continent formation. *Earth and Planetary Science Letters* 256, 510-520.
39. *Johnston, S.*, Hacker, B.R., Ducea, M.N., 2007. Exhumation of ultrahigh-pressure rocks beneath the Hornelen segment of the Nordfjord-Sogn Detachment Zone, western Norway. *Geological Society of America Bulletin* 119, 1232-1248.
40. Blondes, M.S., Reiners, P.W., Ducea, M.N., Singer, B.S., Chesley, J., 2008. Temporal-compositional trends over short and long time-scales in basalts of the Big Pine Volcanic Field, California. *Earth and Planetary Science Letters* 269, 140-154.
41. McQuarrie, N., Robinson, D., Long, S., Tobgay, T., Grujic, D., Gehrels, G., Ducea, M., 2008. Preliminary stratigraphic and structural architecture of Bhutan: Implications for the along strike architecture of the Himalayan system. *Earth and Planetary Science Letters* 272, 105-117.
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