Aleksandar Mišković, PhD, P.Geo.

Tel. +1 (514) 705-7787
http://www.eos.ubc.ca/about/researcher/A.Miskovic.html
amiskovic@eos.ubc.ca

Profile

An interdisciplinary geoscientist leveraging strengths in igneous and isotope geochemistry, regional metallogeny and experimental petrology to the understanding of geochemical evolutions of planetary lithospheres. Dedicated to excellence in research with a focus on collaborative projects with industry partners. Offering internationally acquired field experience working with people from diverse backgrounds on a wide range of scientific problems. Proven ability to generate externally funded research programs on short time scales.

Languages

English, French, Serbian (fluent); conversational Spanish, Russian and Bulgarian/Macedonian

Education

2008 – 2009 **Postdoctoral Fellow, Massachusetts Institute of Technology, Cambridge, MA, USA**

Research theme: Investigating water-storage capacity and hydrous phase stability of deep Martian mantle by high P-T experimentation.

- Examined stabilities of hydrous mineral phases and the vapour-saturated melting of Martian mantle during its early planetary differentiation by conducting high-pressure (>3.6 GPa) piston cylinder experiments on synthetic, chemically analogous Martian mantle material
- Imaged, identified and analysed mineral chemistry of experimental run products by SEM, XRD and EMPA techniques

2004 – 2008 **PhD (Earth Sciences), Université de Genève, Geneva, Switzerland**

Thesis Title: *Magmatic evolution of the Peruvian Eastern Cordilleran Intrusive Belt: Insights into the growth of continental crust and tectonism along the proto-Andean Western Gondwana*

- Measured radiogenic isotope ratios (U-Pb, Rb-Sr, Nd-Sm) of various intrusive and volcanic rocks by ID-TIMS technique; stable isotope systematics ($^{18}O/^{16}O$) of quartz and magnetite
- Performed *in situ* U-Pb dating (ID-TIMS and LA ICP-MS) and Lu-Hf isotopic tracing of magmatic accessory phases (zircon, apatite, and garnet).
- Analysed major, minor and trace element chemistry of whole rocks and minerals by XRF, EMPA, LA ICP-MS, XRD techniques
- Established a geochronological framework for intrusive activity along south-western Gondwana since Mesoproterozoic
- Conducted three field seasons of mapping and sampling of Palaeozoic to Mesozoic batholiths along the 1,400-km strike of the Peruvian Eastern Cordillera from Ecuador to Bolivia
- Teaching assistance with: Introduction to Mineralogy

2002 – 2004 **MSc (Earth Sciences), McGill University, Montreal, Canada**

Thesis Title: *The connection between volcanism and plutonism in the Sifton Range Volcanic Complex, northern Canadian Cordillera*

- Compiled and synthesised geochemical, isotopic and geophysical data (LITHOPROBE–SNORCLE transect) from the northern Canadian Cordillera
- Documented volcanic stratigraphy of the Sifton Range volcanic complex, SW Yukon, Canada
- Conducted two field seasons of mapping and sampling of volcanic and intrusive rocks of the Sifton Range for U-Pb geochronology, major and trace-element chemistry
- Teaching assistance with: Spectroscopy of Minerals, High-Temperature Geochemistry and Introduction to Petrology

1996 – 2001 **BSc (Earth Sciences), Simon Fraser University, Burnaby, Canada**

Thesis Title: *Aggradational response of the Yukon River to the base level change near the White River confluence, Yukon Territory, Canada*

- Mapped glacio-fluvial terraces along the Yukon River, Yukon, Canada
- Sampled organics for ^{14}C dating and lacustrine silts for paleomagnetic reconstruction within raised sea caves along the west coast of Vancouver Island, BC, Canada
- Mapped and sampled Eocene basaltic flows near Merritt, BC, Canada

Expertise

Geochemistry of mineralised and barren volcano-plutonic complexes related to continental and island arc magmatism via bulk rock (XRF, ICP-MS) and in situ analyses (EMP; LA ICP-MS; SIMS) of rock-forming silicates, oxides and sulphides; quantitative petrogenetic modelling; multiphase thermo-barometry of magmatic systems (e.g. south-central Yukon and BC, Peruvian Andes, Swiss Alps, Slave Craton, west-central Tethyan Orogen from Romania to Pakistan)

Fingerprinting magma sources by application of radiogenic (Rb-Sr, Nd-Sm, U-Pb, Lu-Hf, Re-Os) and stable (O, S, H, Cu) isotope systematics to both: whole rock samples by leach-and-residue method and monominerallic concentrates (K-feldspar, galena, pyrite, zircon, magnetite, quartz, alunite, chalcocite); quantifying magma residence times and crustal evolutions

Application of low-blank, high-precision U-Pb geochronology (ID-TIMS) and in situ zircon U-Pb geochronology (LA MC ICP-MS) for determining ages of igneous and metamorphic systems

Petrogenesis of ultra-potassic igneous rocks (kimberlites, memechites, allikites, lamprophyres, Ne-syenites), including geothermobarometry of host cratons derived from entrained mantle xenoliths

Analysis and synthesis of tectono-magmatic and orogenic events along long-lived cratonic margins (northern Canadian Cordillera; Peruvian proto-Andean belt, Alpine-Himalayan belt); paleo-geographic reconstructions

High-temperature, high-pressure experimental petrology applied to examining phase equilibria of deep planetary interiors using gas-mixing furnaces, piston cylinders, and multi-anvil presses

Structural and alteration mapping together with geochemical and hydrothermal fluid characterization of epithermal and porphyry style Au-Ag-Cu deposits

Experience

2012-present **The University of British Columbia, Vancouver, BC, Canada**
Research Associate - Mineral Deposit Research Unit, EAOS Department

Manager of the Western Tethyan Metallogeny Project – a collaborative research partnership with the mineral exploration industry aimed at deciphering magmatic and metallogenic controls on siting of world class porphyry Au-Ag-Cu-Pb-Zn-Mo deposits along the Eurasian west-central Tethyan orogenic belt.

- Conceptualized the project theme, scope and a detailed research plan
- Directly raised over $2.3M of industry-based funding in less than 9 months (largest MDRU collaborative research project to date);
- Supervision of 6 field-based MSc and PhD thesis projects focusing on various aspects of precious and base metallogeny at deposit, district and belt scales;
- Eight months of cumulative mapping, sampling and supervising students in Turkey, Serbia, Armenia, Iran, Greece and Macedonia;
- Project's principal geochronologist and igneous petrologist in charge of U-Pb and Ar-Ar dating, geochemical analytical set up and data interpretation, isotopic fingerprinting and mineral chemistry analyses
- Maintained a regular reporting protocol with the industry partners in terms technical meetings, reports, memoranda and data releases;
- Offered expert tutorship to the industry and academic collaborators.

2009 – 2012 **Indian and Northern Affairs Canada, Yellowknife, NT, Canada**

Diamond Geologist – NWT Geoscience Office

Scientist responsible for regulatory oversight, implementation and co-ordination of scientific research directed at understanding of the distribution of diamondiferous kimberlites and mantle processes that control them in the Canadian north. Clients included: De Beers Canada Inc., BHP Billiton Ltd., Rio Tinto Ltd., Diamonds North Ltd., Indicator Minerals Inc., Peregrine Diamonds Ltd., Sanatana Diamonds Ltd., and Darnley Bay Resources Ltd.

- Conducted a comparative study between the stable isotope evolution of the Canadian continental lithospheric mantle and those found under other cratons globally
- Performed regulatory duties including mine inspection, verification of ore grades and resources in actively producing diamond mines (Diavik, Ekati and Snap Lake)
- Maintained the KIMC (Kimberlite Indicator Mineral Chemistry), KIDD (Kimberlite Indicator and Diamond Database), and KANDD (Kimberlite Anomaly Drillhole) databases for NWT and Nunavut. Uploaded the exploration data to an online GIS application "GoMap" for industry clients
- Led 2010 fieldwork campaign that consisted of: a) sampling of the Mesoarchean Slave cover sequence quartzites at various locations in the south-central Slave province, NT and b) mapping and sampling of the Mountain Diatreme, Mackenzie Fold Belt, NT.
- Led 2011 fieldwork campaign involving an examination of the Tahoe Lake kimberlite field in the central Victoria Island, NU.
- Collaborated with Geological Survey of Canada on the Tri-Territorial Geoscience Integration Project under the Geomapping for Energy and Minerals (GEM) program
- Curated 18 km of Ekati Mine kimberlite core; accommodated requests from researchers to access and sample the core collection by ensuring the fulfilment of research protocols and MOUs

- Fostered collaboration between university and industry researchers, and leveraged personal research budget in support of student research. Collaborated with researchers from various Canadian universities (McGill, U. of Alberta, and UBC)

2004 **CIA Minera Poderosa S.A., Pataz, Eastern Peruvian Cordillera, Peru**
Principal Mapper - Pataz Batholith
Mapped the auriferous Pennsylvanian Pataz Batholith on the 1:25,000 scale

2001 **Geological Survey of Canada, Vancouver, BC, Canada**
Junior Stratigrapher & Research Assistant – Pacific Division
Documented glacio-fluvial and eolian deposits along the central Yukon River, ^{14}C geochronology; sampled Pliocene lava flows for paleomagnetic studies; geomorphologic reconstruction of the Pleistocene-Holocene transition in Eastern Beringia.

- Sampled tephra, till, loess and frozen organics-rich silt "muck" in the north-central Yukon
- Conducted paleomagnetic sampling of basaltic lava flows along the central Yukon River, YT
- Mapped glacio-fluvial and loess deposits along the 200 km segment of the Yukon River between White River and Dawson City, YT
- Performed ^{14}C dating of organic material and paleo-geomorphologic reconstruction of the Pleistocene-Holocene transition of the east-central Beringia
- Engaged in air photo mapping and interpretation of quaternary deposits in the central Yukon and BC

Supervision

2013 – present Structural framework and genesis of the Shahumyan LS polymetallic epithermal deposit, Kapan district, Armenia (**Raja Yarra; MSc**)

2013 – present Structural and lithological controls and hydrothermal fluid sources of the Bigar Hill sediment hosted Au deposit, Timok District, Serbia (**Jelena Zivanovic; MSc**)

2013 – present Structural and fluid controls on mineralisation at the TV Tower and Kirazli Au-Ag epithermal deposits, Biga Peninsula, NW Turkey (**Graham M. Leroux; MSc**)

2013 – present Anatomy and post-ore faulting in the Halilağa Porphyry Cu-Au deposit, NW Turkey (**Paula Brunetti; MSc**)

2013 – present Structural controls, fluid characteristics, and vein paragenesis of the Efemcukuru LS epithermal Au deposit, Turkey (**Kaleb Boucher, MSc**)

2013 – present Metallogeny and tectonism of the Anatolian-Tauride Belt, Turkey (**Fabien Rabayrol; PhD**)

Awards

2011	P. Geo. designation with the Association of Professional Engineers and Geoscientists of British Columbia, Canada
2008	Swiss National Scientific Foundation Postdoctoral Fellowship at MIT
2006	Bourse Marc Birkigt; Société Académique de Genève
2005	Bourse Augustin Lombard; Société de Physique et d'Histoire Naturelle de Genève
2003	Research Scholarship; Centre de Recherche en Géochimie (GEOTOP) - Université du Québec à Montréal
2003	Research Grant; Canadian Northern Scientific Training Program (NSTP) – Government of Canada
2002	M.Sc. Graduate Scholarship; Earth & Planetary Sciences, McGill University
2000	Millennium Scholarship; Government of Canada

Affiliations

2000 - Present	Association of Professional Engineers and Geoscientists of British Columbia
2002 - Present	American Geophysical Union
2002 - Present	Geological Association of Canada
2004 - Present	Geochemical Society
2004 - Present	Geological Society of America
2004 - Present	Mineralogical Society of America
2004 - Present	European Geosciences Union
2004 - Present	European Association of Geochemistry
2004 - Present	Intl. Association of Volcanology and Chemistry of the Earth's Interior
2014 - Present	Society of Economic Geologists

References

Dr. Tom Skulski, Geological Survey of Canada, Ottawa, ON
Tel. +1 613 947-9519, Fax +1 613 995-7997, Tom.Skulski@nrcan-rncan.gc.ca

Prof. Dante Canil, School of Earth and Ocean Sciences, University of Victoria, Victoria, BC
Tel. +1 250 472-4180, Fax +1 250 721-6200, dcanil@uvic.ca

Prof. D. Graham Pearson, Earth & Atmospheric Sciences, University of Alberta, Edmonton, AB
Tel. +1 604 291-4156, Fax + 1 780 492-2030, gdpearson@ualberta.ca

Prof. Dominque Weiss, Earth and Ocean Sciences, University of British Columbia, Vancouver, BC
Tel. +1 604 822-1697, Fax + 1 604 822-6088, dweis@eos.ubc.ca

Prof. Craig Hart, Earth and Ocean Sciences, University of British Columbia, Vancouver, BC
Tel. +1 604 822-5149, Fax + 1 604 822-6088, chart@eos.ubc.ca

Prof. Urs Schaltegger, Department of Mineralogy, University of Geneva, Geneva, Switzerland
Tel. +41 22 379 6638, Fax +41 22 379 3210, Urs.Schaltegger@unige.ch

Prof. Thomas Stachel, Earth & Atmospheric Sciences, University of Alberta, Edmonton, AB
Tel. +1 780 492-0865, Fax + 1 780 492-2030, tstachel@ualberta.ca

Prof. Dave Chew, Geology - School of Natural Sciences, Trinity College Dublin, Ireland
Tel. +353 1 896 34 81, chewd@tcd.ie

Emer. Prof. Don Francis, Earth & Planetary Sciences, McGill University, Montreal, QC, donald.francis@mcgill.ca

Publications

Miskovic, A. and Francis, D., 2003. The Early Tertiary Sifton Range Volcanic Complex, south-western Yukon. In: D. S. Emond and L. L. Lewis (eds.), Yukon Exploration and Geology, Exploration and Geological Services Division, Yukon Region, Indian and Northern Affairs Canada, p. 143-155.

Miskovic, A. and Francis, D., 2006. Interaction between mantle-derived and crustal calc-alkaline magmas in the petrogenesis of the Sifton Range Volcanic Complex, Yukon, Canada. In B.R. Edwards and K. Russell (eds.), Mantle to magma: Lithospheric and Volcanic Processes in Western North America, Lithos, v. 87, p. 104-134.

Chew D.M., Schaltegger U., Košler J., Whitehouse M.J., Gutjahr M., Spikings R.A., Miskovic, A., 2007. U-Pb evidence for the evolution of the Gondwanan margin of the north-central Andes. Geological Society America Bulletin, v. 119, 697-711.

Chew D.M., Magna, Kirkland, C.L., Miskovic, A., Cardona, A., Spikings, R.A., and Schaltegger, U., 2008. Detrital zircon fingerprint of the Proto-Andes: Evidence for a Neoproterozoic active margin? Precambrian Research, v. 167, 186-200.

Miskovic, A. and Schaltegger U., 2009. Crustal growth along a non-collisional cratonic margin: a Lu-Hf isotopic survey of the Eastern Cordilleran granitoids of Peru. Earth and Planetary Science Letters, v. 279, 303-315.

Miskovic, A., Schaltegger, U., Spikings, R. A., Chew, D.M., Košler, J., 2009. Tectono-magmatic evolution of Western Amazonia: geochemical characterization and zircon U-Pb geochronologic constraints from the Peruvian Eastern Cordilleran granitoids. Geological Society of America Bulletin, v. 121, 1289-1324.

Cardona, A., Chew, D.M., Valencia, V.A., Bayona, G., Miskovic, A., Ibañez, M., 2010. Grenvillian remnants in the Northern Andes: Rodinian and Phanerozoic palogeographic perspectives. Journal of South American Earth Sciences, v. 29, 92-104.

Chew, D.M., Cardona, A. and Miskovic, A., 2011. Tectonic evolution of western Amazonia from the assembly of Rodinia to its break-up. International Geology Review 53, 1280-1296.