

# CHRISTOPHER A. BERG

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## RESEARCH INTERESTS

I am interested in the evolution of fabrics, the progress of mineral reactions, and the effects of fluid chemistry on progressive deformation and metamorphism in regional metamorphic terranes. Approaches I use to address these problems include geochemical, microstructural, and analytical techniques, such as application of mineral equilibria and thermodynamic models to reconstruct *PTt* paths; accessory mineral geochronology and thermobarometry; stable isotopic analysis; field relationships and mapping; and petrographic analysis.

## PUBLICATIONS

- Berg, C. A.**, and Hunt, L. E. “Micro-scale textural analysis of layered amphibolite from Carroll County, Georgia: implications for thermobarometry”: *Southeastern Geology*, in prep.
- Berg, C. A.**, and Carlson, W. D. “Refined calculations of strain rate from curved inclusion trails in garnet: Passo del Sole, Central Swiss Alps”: *Journal of Metamorphic Geology*, in prep.
- Berg, C. A.**, and Carlson, W.D. “Controls on length scales of chemical homogeneity and equilibration at Passo del Sole, Central Swiss Alps”: *Swiss Journal of Geosciences*, in prep.
- Berg, C. A.**, and Moecher, D. P., 2005. “Apparent oxygen isotope equilibrium during progressive foliation development and porphyroblast growth in metapelites: implications for stable isotope and conventional thermometry”: *Journal of Metamorphic Geology*, v.23, p.471-487.

## ABSTRACTS

- Hunt, L. E., and **Berg, C. A.**, 2010. “A comparison of major- and trace-element thermometry techniques applied to a banded amphibolite, west-central Georgia”: *Geological Society of America Abstracts with Programs*, submitted.
- Berg, C. A.**, 2010. “Guided inquiry-based learning using a collaborative approach in an upper-division petrology course”: Regional STEM Institute.
- Berg, C. A.**, 2009. “Assessment of equilibrium assemblages, mineral chemistries, and deformational fabrics associated with the growth of centimeter-scale garnet porphyroblasts at Garnet Hill, Paulding County, west-central Georgia”: *Geological Society of America Abstracts with Programs*, v. 41(7), p. 635.
- Hunt, L. E., and **Berg, C. A.**, 2009. “Analysis of spatial and textural relationships among accessory phases in a layered amphibolite: implications for trace-element thermobarometry and geochronology”: *Geological Society of America Abstracts with Programs*, v. 41(7), p. 637.

Spratt, N., and **Berg, C. A.**, 2009. "Investigation of metamorphic conditions associated with the growth of centimeter-scale garnet porphyroblasts at the Garnet Hill locality, west-central Georgia": *Georgia Journal of Science*, v. 67(1), p. 47-48.

**Berg, C. A.**, and Spratt, N., 2008. "Extracting metamorphic conditions from mineral compositions: quantitative assessment of peak metamorphic conditions in the Southern Appalachians of western Georgia": *Geological Society of America Abstracts with Programs*, v. 40(6), p. 255.

**Berg, C. A.**, and Carlson, W. D., 2007. "Outcrop-scale variation in garnet growth zoning: controls on length scales of chemical homogeneity and equilibration at Passo del Sole, Central Swiss Alps": *Geological Society of America Abstracts with Programs*, v. 39(6), p. 394.

**Berg, C. A.**, and Carlson, W. D., 2005. "Refined calculations of strain rates from spiral inclusion trails in garnet: Passo del Sole, Central Swiss Alps": *Geological Society of America Abstracts with Programs*, v.37(7), p. 52.

**Berg, C. A.**, and Moecher, D. P., 2002. "Decoupled oxygen isotope and AFM equilibria in metamorphic rocks": *Geological Society of America Abstracts with Programs*, v.34(6), p. 501.

## EDUCATION

Ph.D., Geological Sciences, University of Texas at Austin. Awarded: May 2007.

Dissertation: Strain rates and constraints on chemical homogeneity and length scales of equilibration during Alpine metamorphism at Passo del Sole, Central Swiss Alps.

Supervisor: Dr. William Carlson

M.S., Geological Sciences, University of Kentucky. Awarded: December 2001.

Thesis: Oxygen isotope and major element systematics in multiply-deformed metamorphic rocks: assessment of oxygen isotope and major element equilibrium.

Supervisor: Dr. David Moecher

B.S., Geology, University of Cincinnati. Awarded June 1999.

## GRANTS/FUNDING PROPOSALS

### Funded:

2010:

- Geological Society of America Southeastern Section Undergraduate Research Grant: Application of trace-element thermobarometry and geochronology to samples of a banded amphibolite, Carroll County, Georgia: Comparison to conventional thermobarometric techniques and implications for metamorphic evolution of the Southern Appalachians, \$550.

2009:

- UWG Faculty Research Grant: Combined petrographic, chemical, and textural investigation of garnet porphyroblasts at Garnet Hill, Georgia: Relating microstructures and mineral chemistries to mountain building, \$1500.
- UWG SRAP: Application of ICP and SEM-EDS analytical techniques to petrologic problems, \$2100.

2008:

- UWG Faculty Research Grant: Extracting metamorphic conditions from mineral compositions: Development of SEM-EDS analytical techniques at West Georgia, and quantitative assessment of peak pressure-temperature conditions during Appalachian metamorphism in the Southern Appalachians, \$1500.
- UWG SRAP: Assessment of Variability of Mineralogy, Bulk Chemistry, and Textural Development in Amphibolites from the Southern Appalachian Piedmont near Carrollton, GA, \$2100.

Unfunded:

2009:

- National Science Foundation (OIA) – Major Research Instrumentation: Acquisition of a Hybrid Confocal Raman/ Atomic Force Microscope to Enhance Faculty and Undergraduate Research, Education, and Museum Curation at the University of West Georgia, Co-PI, \$415,717.

2008:

- National Science Foundation EAR – Instrumentation & Facilities: Acquisition of Laser Ablation ICP-MS Capability at the University of West Georgia, \$303,801.
- GSA Student Research Grant (Spratt): Extracting Metamorphic Conditions from Mineral Compositions: Development of SEM-EDS Analytical Techniques, \$1400

**SUPERVISED STUDENT RESEARCH**

- Tina Skinner (January 2010 – present): Petrography and SEM analysis of Garnet Hill phyllite
- Eric Polly (August 2009 – present): Inclusion assemblages and metamorphic evolution of Garnet Hill phyllite
- Lindsey Hunt (August 2008 – present): Geochronology and trace-element thermobarometry of the Carrollton amphibolites
- Nelson Spratt (August 2007 – May 2009): Extracting metamorphic conditions from mineral compositions: thermobarometry of Carrollton amphibolites

**RESEARCH EXPERIENCE**

University of West Georgia:

- Development of analytical techniques using SEM-EDS instrument, including semi-quantitative cation mapping of mineral phases
- Field measurement and assessment of textures and structures in metamorphosed terranes
- Preparation of polished thin-sections
- Supervision of undergraduate research

University of Texas at Austin:

- Developed advanced skills in the operation of JEOL 8200 electron microprobe; gained proficiency with qualitative and quantitative analytical methods for a variety of silicate minerals; assisted in the development of protocols for x-ray cation mapping of major- and minor-elements.
- Performed Q-LA-ICP-MS trace-element analyses on garnet and zircon.
- Evaluated zoning patterns in zircon (SEM-CL).
- Produced polished thin-sections for petrographic analysis; also identified, located, and produced polished central sections through garnet.

Christopher A. Berg

- Gained familiarity with mechanical mineral separation and chemical dissolution techniques associated with garnet Lu-Hf analysis.
- Mentored undergraduate students in research group.
- Performed thermodynamic calculations and constructed *PT* pseudosections using THERMOCALC software package.
- Performed *in-situ* stable isotopic analysis of garnet using SIMS (UCLA).
- Collected samples, mapped structures and contacts in the Central Swiss Alps.

University of Kentucky:

- Performed major-element quantitative analysis of variety of silicate minerals on ARL-SEMQ electron microprobe; aided in maintenance of machine.
- Prepared samples for bulk chemical analyses, produced mineral separates using both mechanical and chemical separation techniques.
- Assisted in the manufacture of petrographic thin-sections.
- Performed stable isotopic analysis via the laser fluorination method (UNM).
- Collected samples and mapped structures in the New England Appalachians.

**TEACHING EXPERIENCE**

University of West Georgia

- Assistant Professor, Department of Geosciences (Aug. 2007 – present)  
Courses taught: Physical Geology lecture, Physical Geology laboratory, Historical Geology, Igneous/Metamorphic Petrology, Environmental Geology, Plate Tectonics (senior B.S. Geology capstone)  
Other duties: supervision of undergraduate independent research

Alamo Community College District:

- Adjunct Faculty: Earth Science (Aug. 2006 – May 2007)  
Responsibilities: sole instructor of general education course introductory course; designed lectures, exams, in-class exercises, and other course materials; developed online resource for students (PALS webpage); evaluated student work.

University of Texas at Austin:

- Lecturer (Short Course): Modeling Metamorphic P-T-t Paths (March 2007 – present).  
Responsibilities: design, organization, and instruction of graduate-level short course on the utilization of thermodynamic modeling software package.
- Teaching Assistant: Earth Materials, Igneous & Metamorphic Petrology, Structural Petrology (Graduate), Metamorphic Petrology (Graduate) (Fall 2001 – present).  
Responsibilities: organization & preparation of lab materials; evaluation of student work; revision & redesign of laboratory exercises; development of lab exams; office hours.
- Lecturer (Substitute): Structural Petrology, Igneous & Metamorphic Petrology (Spring 2005, Spring 2006).  
Responsibilities: presentation of lectures during absence of professor.

University of Kentucky:

- Teaching Assistant (Jan. 1999 – Dec. 2000): Environmental Geology, Igneous & Metamorphic Petrology.

Responsibilities: organization & preparation of lab materials; evaluation of student work; assistance during field excursions; revision & rewriting of laboratory exercises; preparing course materials; holding office hours.

## **FIELD EXPERIENCE**

- October, 2009: Georgia Geological Society annual field trip – Milledgeville, GA
- February, 2009: Field Relationships in the Palmetto Granite, South Fulton County, GA – Igneous & Metamorphic Geology course field trip
- October, 2008: Georgia Geological Society annual field trip – Cartersville, GA
- April, 2008: Geotraverse across the Blue Ridge of North Carolina, Virginia, and NE Georgia – Plate Tectonics course field trip
- April, 2008: Central and Western Blue Ridge, NC – Igneous & Metamorphic Geology course field trip
- February, 2008: Tyrone Granite Quarry (Florida Rock), Tyrone, GA – joint Structural Geology / Petrology field trip
- October, 2007: Georgia Geological Society annual field trip – Blue Ridge and Piedmont, Southern Appalachians
- Summer, 2002 and 2003: Central Swiss Alps, including 2002 Goldschmidt Conference field trip (“Central Alps and Southern Steep Belt”)
- 2001-2004: various field trips in central Texas, Llano Uplift (UT-Austin)
- Feb. 2001 – May 2001: various field trips in NE Australia during semester abroad at James Cook University, QLD
- Fall 2000: Southern Appalachians: Great Smoky Mtns., Brevard zone (UK)
- Spring 2000: Adirondacks, Catskills, New England Appalachians (UK)
- 1999-2000: various field trips throughout Kentucky (UK)
- Spring 1999: Southern Appalachians: Ducktown, TN, Spruce Pine District (UC)
- Summer 1998: Beartooth Mountains, YBRA; field camp (SIU-Carbondale)
- Spring 1998: Penokean orogen & Mid-continent rifting, UP of Michigan (UC)
- Spring 1997: Catskill clastic wedge, New England Appalachians (UC)

## **SERVICE**

- Member, Faculty Search Committee, Dept. of Geosciences, Spring 2010.
- Director, West Georgia Microscopy Center, July 2009 – present.
- Member, Faculty Search Committee, Dept. of Geosciences, Spring 2009.
- Editor - departmental alumni newsletter, 2008 – present.
- Preview Day, 2008 - 2009: staffed Geosciences booth, promoting department to prospective students and their parents
- Opportunities Committee, Dept. of Geosciences, 2008: aided in preparation of Program Review documentation
- Instructor, “Modeling Metamorphic P-T-t Paths”, informal short course, UT-Austin, Spring 2007.
- Undergraduate mentor, Metamorphic Studies Research Group, UT-Austin.
- Organized weekly departmental brown-bag Petrology-Geochemistry/Structure-Tectonics seminar, UT-Austin, 2003-2004.

Christopher A. Berg

- Member-at-large, Graduate Student Executive Committee, Department of Geological Sciences, UT-Austin, 2002-2003.
- Student volunteer, UT Explore! (University-wide open house).
- Member, Technical Sessions Steering Committee, UT-Austin, 2001-2002.

**PROFESSIONAL AFFILIATIONS**

- Geological Society of America
- Mineralogical Society of America
- Geochemical Society
- Georgia Geological Society

**SELECTED MEETINGS / SHORT COURSES**

- 2010: Regional STEM Institute (University of West Georgia)
- 2008: “Early Career Geoscience Faculty: Teaching, Research, and Managing Your Career”, ‘Science on the Cutting Edge’ workshop (Williamsburg, VA)
- 2007: “Laser Ablation ICP-MS: Fundamentals and Applications” short course, Geological Society of America annual meeting (Denver, CO)
- 2005: “Fund Your Science”: NSF proposal grant-writing workshop, Geological Society of America annual meeting (Salt Lake, UT)
- “Preparing for an Academic Career in the Geosciences”, ‘Science on the Cutting Edge’ workshop (State College, PA)
- Goldschmidt Conference (Moscow, ID)
- “Quantitative P-T-t Paths from Integrated Thermodynamic Modeling & Metamorphic Textures” short course, Geological Society of America, Cordilleran section meeting
- 2004: Geological Society of America annual meeting (Denver, CO)
- 2003: Geological Society of America annual meeting (Seattle, WA)
- 2002: Goldschmidt Conference (Davos, Switzerland)
- “Central Alps and Southern Steep Belt”: pre-conference field trip
- 2000: Geological Society of America annual meeting (Reno, NV)
- 1999: Geological Society of America annual meeting (Denver, CO)