

# Dimitris Xirouchakis

## **EDUCATION**

### **Degrees earned:**

**1997** Ph.D. in Earth and Space Sciences, SUNY Stony Brook.

**1996** M.Sc. in Geology (minor Chemistry), University of Minnesota Duluth.

**1988** Diploma in Geological Sciences, University of Athens, Greece.

### **Other studies:**

**1981-1982** School of Economics, Thessaloniki, Greece.

## **PROFESSIONAL EXPERIENCE**

**2007 – Present Laboratory Director & Partner**

**2004 – 2007 Laboratory Director**

**2003 – 2004 Associate Laboratory Director**

*GeoTerra Ltd - Geomechanics & Quality Control Laboratory, Athens, Greece*

- Laboratory Operations & Quality Management
- Project Management & Business Development
- Materials Consulting & Expert Witness Services

**1999-2003 Research Associate**

*Astromaterials Research Office, NASA JSC & Chemistry Dept., Texas Southern University, Houston, TX*

- Laboratory and computer thermodynamic modeling of Earth & Planetary Materials and Processes
- Assisted in the management of the High Pressure Laboratory, and trained students and visiting scientists

**1997-1999 Postdoctoral Fellow**

*Department of Geology and Geophysics, University of Minnesota Twin Cities, MN*

- Laboratory and thermodynamic modeling of mineral-melt equilibria
- Experimental Petrology Laboratory management and student training.

**1991-1997 Graduate Research & Teaching Assistant**

*Department of Earth and Space Sciences, SUNY at Stony Brook, NY*

- Laboratory and computer thermodynamic modeling of mineral structure-property relations and equilibria
- Responsible for Mineralogy-Petrology of crystalline rocks and Structural Geology laboratories

**1989-1991 Graduate Research & Teaching Assistant**

*Department of Geology, University of Minnesota Duluth, MN*

- Field and laboratory studies of thermally metamorphosed rocks
- Taught Introductory Geology, Igneous and Metamorphic Mineralogy-Petrology, and Structural Geology laboratories

**1988-1989 Assistant Mineralogist**

*Public Petroleum Corporation & Department of Geosciences, University of Athens*

- Drill core sample analysis and characterization.

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## **RESEARCH EXPERTISE & INTERESTS**

Inorganic Materials Properties and Thermodynamics  
Chemical Earth and Planetary Sciences

## **TECHNICAL EXPERTISE**

Design of Experiments. Descriptive Statistics & Optimization. MS Windows OS. SPSS. MATLAB. Thermochemistry and Computational Thermodynamic Modeling of minerals and rocks. Transmitted and reflected light microscopy techniques for mineral identification in rock and environmental samples. Electron microprobe, X-ray Diffraction and X-ray Fluorescence analysis of environmental and rock samples. Testing, evaluation, and mix design of soil, rocks, and construction materials.

## **AFFILIATIONS**

American Geophysical Union  
ASTM Committee C07 on Lime  
ASTM Committee C09 on Concrete and Aggregates  
ASTM Committee C18 on Dimension Stone  
ASTM Committee D04 on Road and Paving Materials  
ASTM Committee D18 on Soil and Rock Testing  
American Society for Quality, Statistics Division  
European Geosciences Union  
Eurostars Technical Expert  
Intota Network of Experts  
Geochemical Society  
Geological Society of Greece  
Accreditation Council of Greece Geological and Geotechnical Investigations Expert  
Registry of Geotechnical Professionals, Greece  
Registry of Consulting Geologists, Greece

## **AWARDS**

**1998** Academy of Sciences C.A. Ktenas Prize in Mineral Sciences, Athens, Greece (joint with D.H. Lindsley)  
**1990** Sigma Xi Graduate Research Award

## **ACTIVITIES**

**Journal reviewer:** American Mineralogist; Chemical Geology; Geochimica et Cosmochimica Acta; Physics and Chemistry of Minerals; Geology; Meteoritics and Planetary Science; Lithos.

**Speaker:** Bavarian Geosciences Institute; University of Minnesota Duluth; University of Minnesota Twin Cities; Texas A&M University College Station; SUNY Stony Brook; Florida International University; Jet Propulsion Laboratory; Presentations to Clear Lake (Houston, TX) schools; The Voice of America Science Program; University of Athens.

**Technical Editor & Reviewer**

## **JOURNAL PUBLICATIONS**

# Dimitris Xirouchakis

1. **Xirouchakis, D.** (2007) Pseudobrookite-group oxide and basaltic melts. "The Role of Accessory Minerals in Rocks: Petrogenetic Indicators of Metamorphic and Igneous Processes, theme session VGP8 of the annual European Geosciences Union General Assembly". D. Harlov (Ed.). *Lithos*, 95, 1-9.
2. Treiman, A., Lanzirotti, A., and **Xirouchakis, D.** (2004) Ancient Water on Asteroid 4 Vesta: Evidence from a Quartz Veinlet in the Serra de Magé Eucrite Meteorite. *Earth and Planetary Science Letters*, 219, 189-199.
3. Draper, D.S., **Xirouchakis, D.**, and Agee, C.B. (2003) Garnet-melt trace element partitioning at 5 to 9 GPa: Effect of the onset of transition to majorite. *Physics of Earth and Planetary Interiors. Special Issue: Diffusion and Element Partitioning*, 139, 149-169.
4. **Xirouchakis, D.**, Smirnov, A., Woody, K., Lindsley, D.H., and Andersen, D.J. (2002). Thermodynamics and stability of pseudobrookite-type  $MgTi_2O_5$  (karrooite). *American Mineralogist*, 87, 658-667.
5. **Xirouchakis, D.**, Draper, D.S., Schwandt, C.S., and Lanzirotti, A. (2002) Crystallization conditions of Los Angeles, a basaltic Martian meteorite. *Geochimica et Cosmochimica Acta*, 66, 10, 1861-1874.
6. **Xirouchakis, D.**, Hirschmann, M.M., and Simpson J.A. (2001) The effect of titanium on the silica content and on mineral-liquid partitioning of mantle-equilibrated melts. *Geochimica et Cosmochimica Acta*, 65, 14, 2201-2217.
7. Tangeman, J.A. and **Xirouchakis, D.** (2001) High temperature heat capacity and thermodynamic properties of end-member Titanite. *Physics and Chemistry of Minerals*, 28, 167-176.
8. **Xirouchakis, D.**, Lindsley, D.H., Andersen, D.J. (2001) Assemblages with titanite ( $CaTiOSiO_4$ ), Ca-Mg-Fe olivine and pyroxenes, Fe-Mg-Ti oxides, and quartz: Part I. Theory. *American Mineralogist*, 86, 247-253.
9. **Xirouchakis, D.**, Lindsley, D.H., Frost, B.R. (2001) Assemblages with titanite ( $CaTiOSiO_4$ ), Ca-Mg-Fe olivine and pyroxenes, Fe-Mg-Ti oxides, and quartz: Part II. Application. *American Mineralogist*, 86, 254-264.
10. Angel, R.J., Kunz, M., Milletich, P., Woodland, B.A., Koch, M., **Xirouchakis, D.** (1999). High-pressure phase transition in titanite ( $CaTiOSiO_4$ ). *Phase Transitions*, 68, 533-543.
11. **Xirouchakis, D.**, and Lindsley, D.H. (1998). Equilibria among titanite, hedenbergite, fayalite, quartz, ilmenite, and magnetite: experiments and internally consistent thermodynamic data for titanite. *American Mineralogist*, 83, 712-725.
12. Kunz, M., **Xirouchakis, D.**, Wang, Y., Parise, J.B, and Lindsley, D.H. (1997). Structural investigations along the  $CaTiOSiO_4$ - $CaSnOSiO_4$  join. *Swiss Bulletin of Mineralogy and Petrology*, 77, 1-11.
13. **Xirouchakis, D.**, Kunz M., Parise, J.B., and Lindsley, D.H. (1997). Synthesis conditions and unit cell parameters of synthetic end-member titanite ( $CaTiOSiO_4$ ). *American Mineralogist*, 82, 748-753.

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14. **Xirouchakis, D.**, Fritsch, S., Putnam, L.R., Navrotsky, A., and Lindsley, D.H. (1997). Thermochemistry and the standard enthalpy of formation of end-member titanite ( $\text{CaTiSiO}_5$ ). *American Mineralogist*, 82, 754-759.
15. Kunz, M., **Xirouchakis, D.**, Lindsley, D.H., and Häusermann, D. (1996). High-pressure phase transition in titanite ( $\text{CaTiOSiO}_4$ ). *American Mineralogist*, 81, 1527-1530.

## **CONFERENCE PROCEEDINGS & ABSTRACTS**

1. Profitis, E.G., Chatzitheodoridis, E., and **Xirouchakis, D.**, (2011), Digital methods for flakiness and shape index definition, ETNDDT5, 5<sup>th</sup> International Conference on Emerging Technologies in Non-Destructive Testing.
2. **Xirouchakis, D.** and **Manolakou, V.** (2011), Properties of an EAF slag produced in Greece, a construction material for sustainable growth, 5<sup>th</sup> International Conference for Bituminous Mixtures and Pavements.
3. **Xirouchakis, D.** and **Theodoropoulos, A.** (2009), Crushed limestone aggregates for concrete and masonry: Results from tests according to EN 12620, EN 13043, EN 13242, and EN 13139 standards. 16<sup>th</sup> Concrete Conference, Cyprus.
4. **Xirouchakis, D.** (2008) Immiscibility and critical points in titanite solid solutions: The binaries  $\text{CaTiOSiO}_4$ - $\text{CaSnOSiO}_4$  and  $\text{CaTiOSiO}_4$ - $\text{CaSiOSiO}_4$ . *Geophysical Research Abstracts*, Vol. 10, 01294.
5. **Xirouchakis, D.**, Bouzinos, A., Antonopoulos, K., and Boukouvalas, V. (2008) Physical and mechanical characteristics of crushed limestone aggregates from Greece: Preliminary data evaluation. *Geophysical Research Abstracts*, Vol. 10, 05150.
6. **Xirouchakis, D.**, (2006) Redox equilibria and crystallization of Martian basaltic meteorites. *Geophysical Research Abstracts*, Vol. 8, 05685.
7. **Xirouchakis, D.** (2005) Orthorhombic Ti oxides and planetary magmas. *European Geosciences Union Assembly Geophysical Research Abstracts*, Vol. 7, 00771.
8. Treiman, A., Lanzirotti, A., and **Xirouchakis, D.** (2004) Synchrotron X-Ray Diffraction analysis of meteorites in thin section: Preliminary Results. 35<sup>th</sup> Lunar and Planetary Science Conference. Abstract 1772.
9. **Xirouchakis, D.**, and Caprarelli, G. (2004) Phosphorous and REE partitioning during mantle melting and implications for Martian mantle compositions. 17<sup>th</sup> Australian Geological Convention.
10. **Xirouchakis, D.** (2003) Oxide-silicate interaction in Planetary Interiors: Pseudobrookite Ti Oxides (Invited). *GSA, Abstracts with Programs* Vol. 35, No. 6.
11. Berlin J., and **Xirouchakis, D.** (2002) Phosphorus equilibria among mafic silicate phases (Invited). *GSA Abstracts with Programs* Vol. 34, No. 6.
12. **Xirouchakis, D.** (2002) Stability of pseudobrookite-type titanium oxides. *Eos, Transactions, American Geophysical Union*, 83, 19, S341.

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13. **Xirouchakis, D.** and Draper, D.S. (2002) Phosphorus partitioning among mantle silicate phases. *Eos, Transactions, American Geophysical Union*, 83, 19, S379.
14. Draper, D.S., **Xirouchakis, D.**, and Agee, C.B. (2002) Garnet-melt trace element partitioning from 5 to 9 GPa: Onset of garnet to majorite transformation. *Eos, Transactions, American Geophysical Union*, 83, 19, S387.
15. Draper, D.S., **Xirouchakis, D.**, and Agee, C.B. (2002) Effect of majorite transformation on garnet-melt trace element partitioning. 33<sup>rd</sup> Lunar and Planetary Science Conference. Abstract #1306.
16. **Xirouchakis, D.**, Draper, D.S., and Agee, C.B. (2002) The garnet to majorite transformation in mafic compositions. 33<sup>rd</sup> Lunar and Planetary Science Conference. Abstract #1316.
17. **Xirouchakis, D.**, Draper, D.S., and Schwandt, C.S. (2001). A reappraisal of the Mineralogy and Crystallization Features of Los Angeles, a basaltic Martian meteorite. 32<sup>nd</sup> Lunar and Planetary Science Conference. Abstract #1589.
18. Draper, D.S., Chabot, N.L., **Xirouchakis, D.M.**, Agee, C.B., and Wasserman, A.A. (2001). Partitioning of Nd, Tb, Lu, and Hf between Garnet and Ordinary Chondrite Melt at 5 to 10 GPa. 32<sup>nd</sup> Lunar and Planetary Conference. Abstract # 1681.
19. **Xirouchakis, D.**, Lanzirotti, A., Draper, D.S., Agee, C. (2001) The mineralogy and geochemistry of Los Angeles, a Martian basaltic meteorite. National Synchrotron Light Source activity report. Beamline X26A. Abstract noXiro110.
20. **Xirouchakis, D.**, Draper, D.S., and Schwandt, C.S. (2000). Petrologic Features of the SNC Los Angeles meteorite 5103. *Eos, Transactions, American Geophysical Union*, 81, 48, F782.
21. Lane, M.D., Draper, D.S., and **Xirouchakis, D.** (2000). Thermal emission spectroscopy of synthetic coesite and stishovite. 31<sup>st</sup> Lunar and Planetary Science Conference. Abstract #1159.
22. **Xirouchakis, D.**, Hirschmann, M.M., and Draper, D.S. (2000). The effect of titanium and alkalis on the Fe-Mg  $K_D$  between olivine and liquid. 31<sup>st</sup> Lunar and Planetary Science Conference. Abstract #1430.
23. **Xirouchakis, D.** and Lindsley, D.H. (2000). Interpreting Assemblages with Titanite (Sphene): It does not have to be Greek to you. *Eos, Transactions, American Geophysical Union*, 81, 19, S28.
24. **Xirouchakis, D.** and Hirschmann, M.M. (1999). The effect of  $TiO_2$  on the  $SiO_2$  content of olivine-orthopyroxene-saturated synthetic basaltic liquids. *Eos, Transactions, American Geophysical Union*, 80, 17, S351.
25. **Xirouchakis, D.**, and Tangeman, J.A. (1998). Thermochemistry of end-member titanite ( $CaTiSiO_4$ ). *Eos, Transactions, American Geophysical Union*, 79, F880.

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26. **Xirouchakis, D.** and Lindsley, D.H. (1998). Oxide-silicate equilibria: assemblages with titanite. *Experimental Mineralogy, Petrology, and Geochemistry VII, TERRA Abstracts*, suppl. 1, Vol. 10, p. 69-70.
27. **Xirouchakis, D.** and Lindsley, D.H. (1997). Equilibria among titanite, hedenbergite, fayalite, quartz, ilmenite, and magnetite: Experiments, internally consistent thermodynamic data for titanite, and applications. *EUG 9, abstracts with programs*.
28. **Xirouchakis, D.**, Navrotsky, A., and Lindsley, D.H. (1996). Synthesis and thermochemistry of end-member titanite (CaTiSiO<sub>4</sub>). *Geological Society of America, abstracts with programs*, Vol 28, no 7.
29. **Xirouchakis, D.**, Kunz, M., Parise, J.B., Lindsley, D.H., and Cox, D. (1996). Synthesis conditions and unit cell parameters of synthetic end-member titanite (CaTiSiO<sub>4</sub>). *Eos, Transactions, American Geophysical Union*, 77, S144.
30. **Xirouchakis, D.** and Lindsley D.H. (1995). Low-pressure equilibria among titanite (sphene), hedenbergite, iron-titanium oxides, and silica: experiments and internally consistent thermodynamic data for titanite. *V. M. Goldschmidt Conference, Penn State, Programs and Abstracts*, 98.
31. **Xirouchakis, D.** and Lindsley, D.H. (1993). Experimental investigation of some mineral equilibria with titanite (sphene) in the system CaO-FeO-Fe<sub>2</sub>O<sub>3</sub>-TiO<sub>2</sub>-SiO<sub>2</sub>. *Eos, transactions, American Geophysical Union*, 74, S167.

*References available upon request*