

# George Mackay Salley

## Associate Professor

2002- present  
Department of Physics  
Wofford College

## Visiting Scientist

2009  
Department of Chemistry  
University of Washington  
Seattle, WA

## Visiting Researcher

2008 – 2009  
Optoelectronics Division  
NIST – Boulder, CO

## Post-doctoral Research Fellowship

2000-2002: Upconversion studies of single-ion and dimer systems  
Department of Chemistry and Bio-Chemistry  
University of Bern, Bern Switzerland  
Advisor: Professor Hans Güdel

## Education

2000: Doctor of Philosophy in the Department of Physics and Astronomy at the University of Georgia;  
Topic: "Photoelectric and Optical Spectroscopy of  $\text{LiNbO}_3:\text{Cr}^{3+}$ : Nature of the Photovoltaic Effect";  
Advisor: Professor Uwe Happek

1995: Bachelor of Science in Physics and Math, Wofford College

## Awards and Recognitions

National Science Foundation: Solid State Chemistry and Physics Grant (2007)  
National Science Foundation GRF panelists (2007)  
National Science Foundation GRF panelists (2006)  
South Carolina Space Grant Consortium (2006)  
National Science Foundation GRF panelists (2005)  
Wofford Faculty Summer Research Grant (2004)  
South Carolina Space Grant Consortium (2004)  
William E. Cummings Award of Excellence, UGA Department of Physics and Astronomy (2000)  
Outstanding Teaching Award; The University of Georgia Graduate School (2000)

## Publications

Beaulac R, Archer PI, Liu XY, Lee S, Salley GM, Dobrowolska M, Furdyna JK, Gamelin DR, **Spin-polarizable excitonic luminescence in colloidal  $\text{Mn}^{2+}$ -doped CdSe quantum dots** *NANO LETTERS*, **8** 1197-1201 (2008).

U. Happek and G.M. Salley **Photoionization Energies of  $\text{Cr}^{3+}$ -doped  $\text{LiNbO}_3$**  *J. Lumin.*, **125** 104-107 (2007).

Norberg, N. S.; Parks, G. L.; Salley, G. M.; Gamelin, D. R. **Giant Excitonic Zeeman Splittings in Colloidal Co<sup>2+</sup>-doped ZnSe Quantum Dots** *J. Am. Chem. Soc.*, 128, **6**, 13195-13203 (2006).

William K. Liu, G. Mackay Salley, and Daniel R. Gamelin  
**Spectroscopy of Photovoltaic and Photoconductive Nanocrystalline Co<sup>2+</sup>-Doped ZnO Electrodes**  
*J. Phys. Chem.* 109, 14486 - 14495 (2005)

G.M. Salley, R. Valiente, and H.U. Güdel  
**Cooperative Yb<sup>3+</sup>-Tb<sup>3+</sup> Dimer Excitations and Upconversion in Cs<sub>3</sub>Tb<sub>2</sub>Br<sub>9</sub>:Yb<sup>3+</sup>**  
*Phys. Rev. B* 67, 134111 (2003)

Annina Aebischer, G. Mackay Salley and Hans U. Güdel  
**Near infrared to visible photon upconversion in Re<sup>4+</sup> doped Cs<sub>2</sub>ZrBr<sub>6</sub>**  
*J. Chem. Phys.* 117, 8515-8522 (2002)

G.M. Salley, O.S. Wenger, K. Krämer and H.U. Güdel  
**Inorganic Solid State Optical Materials**  
*Curr. Opin. Solid State Mater. Sci.* 6, 1 (2002)

Oliver S. Wenger, G. Mackay Salley and H. U. Güdel  
**Effects of High Pressure on the Luminescence and Upconversion Properties of Ti<sup>2+</sup>-Doped NaCl**  
*J. Phys. Chem. B* 106, 10082-10088 (2002)

G. M. Salley, R. Valiente and H. U. Güdel  
**Phonon-assisted cooperative sensitization of Tb<sup>3+</sup> in SrCl<sub>2</sub>:Yb, Tb**  
*J. Phys.: Condens. Matter* 14, 5461-5475 (2002)

Oliver S. Wenger, G. Mackay Salley, Rafael Valiente and Hans U. Güdel  
**Luminescence upconversion under hydrostatic pressure in the 3d-metal systems Ti<sup>2+</sup>:NaCl and Ni<sup>2+</sup>:CsCdCl<sub>3</sub>**  
*Phys. Rev. B* 65, 212108/1-4 (2002)

G. M. Salley, R. Valiente and H. U. Güdel  
**Luminescence upconversion mechanisms in Yb<sup>3+</sup>-Tb<sup>3+</sup> systems**  
*J. Lumin.* 94-95, 305-309 (2001)

A.A. Kaplyanskii, S.A. Basun, U. Happek, R.S. Meltzer, G.M. Salley  
**Photoionization related phenomena in doped insulators: the role of inversion site symmetry of impurity centers**  
*Radiat. Eff. Defect. S.* 155, 1-9 (2001).

G. M. Salley, S. A. Basun, A. A. Kaplyanskii, R. S. Meltzer, K. Polgar, U. Happek  
**Chromium Centers in Stoichiometric LiNbO<sub>3</sub>**  
*J. Lumin.* 87-89, 1133-1135 (2000)

S. A. Basun, G. M. Salley, A. A. Kaplyanskii, K. Polgar, L. Lu, U. Happek  
**A Novel Luminescent Center in LiNbO<sub>3</sub>:Cr:Mg**  
*J. Lumin.* 83-84, 435-439 (1999)

G. M. Salley, S. A. Basun, G. F. Imbusch, A. A. Kaplyanskii, S. Kapphan, R. S. Meltzer, U. Happek  
**Chromium Centers in LiNbO<sub>3</sub> Revisited**  
*J. Lumin.* 83-84, 423-427 (1999)

## Courses Taught

Physics 104: Physics for non-science majors  
Physics 121-122: Algebra based general physics

Physics 141-142: Calculus based general physics  
Physics 211: Modern Physics  
Physics 221: Analytical Mechanics  
Physics 250: Introduction to research  
Physics 330: Optics  
Physics 371-374: Advanced Laboratory  
Physics 380: Solid State Physics  
Physics 450: Research

## **Professional Presentations**

**Photoelectric and Optical Spectroscopy of CdSe nanoparticles doped with Mn<sup>2+</sup>, *NSF Summer Research Program in Solid State and Materials Chemistry*(2007)**

**Photon upconversion in the Yb<sup>3+</sup> – Tb<sup>3+</sup> system, *Invited Colloquium Georgia Southern University, Statesboro, GA* (2006)**

**Enhanced NIR-to-VIS Mo<sup>3+</sup> and Re<sup>4+</sup> Upconversion through Yb Host Sensitization, *8th International Hole Burning, Molecular, and Non-linear Spectroscopies, Bozeman, MT* (2003)**

**Pressure dependence of excited state dynamics and luminescence properties of the d<sup>2</sup> electronic cross-over system V<sup>3+</sup>:Cs<sub>2</sub>NaYBr<sub>6</sub>, *Southeastern Sectional Meeting of the American Physical Society, Auburn, AL* (2002)**

**Photon upconversion in the Yb<sup>3+</sup>-Tb<sup>3+</sup> exchange coupled dimer, *University of Bern, Bern, Switzerland* (2001)**

**Upconversion mechanisms in the Yb-Tb dimer system, *Dynamic Processes in Condensed Matter, Lyon, France* (2001)**

**Site dependent polarity reversal of the photovoltaic effect in LiNbO<sub>3</sub>:Cr<sup>3+</sup>, *American Physical Society March Meeting, Minneapolis, MN* (2000)**

**Chromium Centers in LiNbO<sub>3</sub>, Revisited, *Dynamic Processes in Condensed Matter, Humacau, Puerto Rico* (1999)**

**A novel luminescent center in LiNbO<sub>3</sub>:Cr:Mg, *Dynamic Processes in Condensed Matter, Humacau, Puerto Rico* (1999)**

**Nature of the photovoltaic effect in LiNbO<sub>3</sub>:Cr<sup>3+</sup>, *American Physical Society March Meeting, Atlanta, GA* (1999)**

**Location of Rare Earth ground states with respect to the host band gap, *American Physical Society March Meetings, Los Angeles, CA* (1998)**

**Photoconductivity and its applications towards research, *Invited Talk for Department of Physics at Wofford College, Spartanburg, SC* (1998)**

**Scintillator properties of LuBO<sub>3</sub>:Ce<sup>3+</sup>, *American Physical Society March Meeting, Kansas City, MO* (1997)**