

George Mackay Salley

Associate Professor

2002- present
Department of Physics (Department Chairman 2010-present)
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 GRF panelists (2009)
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

Claire A. Johnson, Alicia Cohn, Tiffany Kaspar, Scott A. Chambers, G. Mackay Salley, and Daniel R. Gamelin. **Visible-light photoconductivity of $\text{Zn}_{1-x}\text{Co}_x\text{O}$ and its dependence on Co^{2+} concentration** *Physical Review B* 84, 125203 (2011)

Johnson CA, KR Kittilstved, TC Kaspar, T Droubay, SA Chambers, GM Salley, and DR Gamelin. **Mid-Gap Electronic States in $\text{Zn}_{1-x}\text{Mn}_x\text{O}$** *Physical Review. B* 82, 115202 (2010)

Claire A. Johnson, Tiffany C. Kaspar, Scott A. Chambers, G. Mackay Salley, and Daniel R. Gamelin, **Sub-band-gap photoconductivity in Co²⁺-doped ZnO** *Physical Review B* 81, 125206 (2010).

M. A. Rowe, G. M. Salley, E. J. Gansen, S. M. Etzel, S. W. Nam, and R. P. Mirin, **Analysis of photoconductive gain as it applies to single-photon detection** *Journal of Applied Physics* 107, 063110 (2010).

Beaulac R, Archer PI, Liu XY, Lee S, Salley GM, Dobrowolska M, Furdyna JK, Gamelin DR, **Spin-polarizable excitonic luminescence in colloidal Mn²⁺-doped CdSe quantum dots** *NANO LETTERS*, 8 1197-1201 (2008).

U. Happek and G.M. Salley **Photoionization Energies of Cr³⁺-doped LiNbO₃** *J. Lumin.*, 125 104-107 (2007).

Norberg, N. S.; Parks, G. L.; Salley, G. M.; Gamelin, D. R. **Giant Excitonic Zeeman Splittings in Colloidal Co²⁺-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 Co²⁺-Doped ZnO Electrodes *J. Phys. Chem.* 109, 14486 - 14495 (2005)

G.M. Salley, R. Valiente, and H.U. Güdel
Cooperative Yb³⁺-Tb³⁺ Dimer Excitations and Upconversion in Cs₃Tb₂Br₉:Yb³⁺ *Phys. Rev. B* 67, 134111 (2003)

Annina Aebischer, G. Mackay Salley and Hans U. Güdel
Near infrared to visible photon upconversion in Re⁴⁺ doped Cs₂ZrBr₆ *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 Ti²⁺-Doped NaCl *J. Phys. Chem. B* 106, 10082-10088 (2002)

G. M. Salley, R. Valiente and H. U. Güdel
Phonon-assisted cooperative sensitization of Tb³⁺ in SrCl₂: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 Ti²⁺:NaCl and Ni²⁺:CsCdCl₃ *Phys. Rev. B* 65, 212108/1-4 (2002)

G. M. Salley, R. Valiente and H. U. Güdel
Luminescence upconversion mechanisms in Yb³⁺-Tb³⁺ 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 LiNbO₃ *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 LiNbO₃: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 LiNbO₃ 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
Physics 480: Statics

Professional Presentations

Photoelectric and Optical Spectroscopy of CdSe nanoparticles doped with Mn²⁺, NSF Summer Research Program in Solid State and Materials Chemistry(2007)

Photon upconversion in the Yb³⁺ – Tb³⁺ system, Invited Colloquium Georgia Southern University, Statesboro, GA (2006)

Enhanced NIR-to-VIS Mo³⁺ and Re⁴⁺ 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 d² electronic cross-over system V³⁺:Cs₂NaYBr₆, Southeastern Sectional Meeting of the American Physical Society, Auburn, AL (2002)

Photon upconversion in the Yb³⁺-Tb³⁺ 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 LiNbO₃:Cr³⁺, American Physical Society March Meeting, Minneapolis, MN (2000)

Chromium Centers in LiNbO₃ Revisited, Dynamic Processes in Condensed Matter, Humacau, Puerto Rico (1999)

A novel luminescent center in LiNbO₃:Cr:Mg, Dynamic Processes in Condensed Matter, Humacau, Puerto Rico (1999)

Nature of the photovoltaic effect in LiNbO₃:Cr³⁺, 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 LuBO₃:Ce³⁺, American Physical Society March Meeting, Kansas City, MO (1997)