

## CURRICULUM VITAE

### Mark T. Reynolds

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917 Dennison Building,  
500 Church St.,  
Ann Arbor,  
MI 48109

Phone:(734) 764-4160  
Email: markrey@umich.edu  
Homepage: <http://www.astro.lsa.umich.edu/~markrey/>

#### Personal Details:

Date of Birth: 25<sup>th</sup> August 1981  
Nationality: Irish  
Marital status: Single

#### Education:

Ph.D. Astrophysics

2008, University College Cork  
**Title:** Optical & IR observations of quiescent LMXBs.  
**Advisor:** Dr. Paul Callanan

B.Sc. Astrophysics

2003, University College Cork  
Graduated with first class honours

#### Employment:

##### **Present:**

Postdoctoral researcher (w/ Miller) in the astronomy department at the University of Michigan since June 2008.

#### Research Interests:

X-ray binaries containing black holes: Investigating sources of non-stellar flux in the IR, black hole mass determinations, disc-jet connections at low accretion rates.

Neutron star XRNe, “Black widow” pulsars, Accreting X-ray Millisecond Pulsars, Neutron star mass determination, LMXB - millisecond radio pulsar link.

Extragalactic X-ray binaries, Supermassive black-holes, Supernovae, Gamma ray bursts, Cataclysmic variables.

#### Research Skills:

I have considerable experience in planning and analysis of both photometric and spectroscopic observations of transient X-ray binary systems while in outburst and quiescence, including:

- Optical/IR data analysis with IRAF.  
e.g. HST (WFPC2), Spitzer (IRAC, MIPS), Keck (NIRC, LRIS, HIRES), Gemini-North (GMOS, NIRI), VLT (FORIS1), Magellan (PANIC, IMACS)
- Mid-IR data analysis (Spitzer: IRAC/MIPS) with the Spitzer data reduction facility MOPEX.
- X-ray data analysis with Xspec. e.g. Suzaku, XMM, Swift

In addition, I am well versed in Linux (including system administration), C and numerical methods including timing analysis (Lomb-Scargle periodogram, power density spectrum) and X-ray binary light curve modelling in both the Optical and IR.

### **Professional Memberships:**

American Astronomical Society (AAS) & High Energy Astrophysics Division (HEAD)

### **Teaching Experience:**

Undergraduate student project supervisor  
University of Michigan, summer 2009

Supervisor/Demonstrator  
UCC Astrophysics degree annual 3<sup>rd</sup> year observing trip to Kryoneri Observatory, Greece, 2004-2006

Laboratory Demonstrator  
University College Cork, 2002-2006

### **Observing Facilities Used:**

- Suzaku
- XMM Newton
- Spitzer Space Telescope
- Keck Observatory
- VLT Observatory
- Magellan Telescope
- MDM Observatory
- Kryoneri Observatory
- Chandra
- Swift
- Hubble Space Telescope
- Gemini Observatory
- MMT Observatory
- WIYN Observatory
- Chandra Himalayan Telescope
- IAC80 telescope

### **Talks:**

“X-Ray Binary Systems”  
MSU-UM interchange talk, Michigan State University, 21<sup>st</sup> January 2009.

“Suzaku Broadband Spectroscopy of the Black Hole Candidate Swift J1753.5-0127”  
213<sup>th</sup> AAS meeting, Long Beach, California, 4<sup>th</sup> – 8<sup>th</sup> January 2009.

“IR Contamination from the Accretion Disc in Quiescent X-Ray Novae”  
Astronomy Science Group of Ireland Spring Meeting, Armagh Observatory, 14<sup>th</sup> March, 2008.

“The Black Widow Pulsar PSR B1957+20”  
Astronomy Science Group of Ireland Spring Meeting, University College Cork, 3<sup>rd</sup>/4<sup>th</sup> May, 2006.

### **Honors and Awards:**

UCC College Scholar 2003

## PUBLICATION LIST

Mark T. Reynolds

### Refereed Papers:

1. "Suzaku Observations of the Galactic Center Microquasar 1E 1740.7-2942"  
**Reynolds M.T.**, Miller J.M., 2009, ApJ submitted.
2. "Suzaku Broadband Spectroscopy of SWIFT J1753.5-0127 in the Low-Hard State"  
**Reynolds M.T.**, Miller J.M., Homan J., Miniutti G., 2009, ApJ submitted.
3. "A Photometric Study of the Field Around the Candidate Recoiling/Binary Black Hole SDSS J092712.65+294344.0"  
Decarli R., **Reynolds M.T.**, Dotti M., 2009, MNRAS submitted.
4. "Broad Relativistic Iron Emission Line Observed in SAX J1808.43658"  
Cackett E.M., Altamirano D., Patruno A., Miller J.M., **Reynolds M.T.**, Linares M., Wijnands R., 2009, ApJ, 694, 21.
5. "Optical Spectroscopy and Photometry of SAX J1808.4-3658 in Outburst"  
Elebert P., **Reynolds M.T.**, Callanan P.J., Hurley D.J., Ramsay G., Lewis F., Russell D.M., Nord B., Kane S.R., DePoy D.L., Hakala P., 2009, MNRAS in press (arXiv:0901.3991).
6. "IR Contamination in Galactic X-Ray Binaries"  
**Reynolds M.T.**, Callanan P.J., Robinson E., Froning C., 2008, MNRAS, 387, 788
7. "The Light Curve to the Companion of PSR B1957+20"  
**Reynolds M.T.**, Callanan P.J., Fruchter A.S., Torres M.A.P., Beer M.E., Gibbons R.A., 2007, MNRAS, 379, 1117
8. "Keck Infrared Observations of GRO J0422+32 in Quiescence"  
**Reynolds M.T.**, Callanan P.J., Filippenko A.V., 2007, MNRAS, 374, 657

### Conference Proceedings:

1. "The Optical Counterparts of Binary Millisecond Pulsars in Quiescence"  
Callanan P.J., **Reynolds M.T.**, Elebert P., Filippenko A.V., Foley R.J., Garnavich P.M., Mackie G., 2006, 26<sup>th</sup> Texas Symposium on Relativistic Astrophysics, Melbourne University, 11-15 December
2. "On the Reliability of Galactic Black Hole Mass Estimates from Ellipsoidal IR Studies"  
**Reynolds M.T.**, Callanan P.J., 2006, 26<sup>th</sup> Texas Symposium on Relativistic Astrophysics, Melbourne University, 11-15 December
3. "IR Observations of Quiescent Black Hole XRNe"  
**Reynolds M.T.**, Callanan P.J., Black Holes: From Stars to Galaxies - Across the Range of Masses, International Astronomical Union. Symposium no. 238, held 21-25 August, 2006 in Prague, Czech Republic, S238, 149
4. "Optical Observations of Binary Millisecond X-ray Pulsars in Quiescence"  
Callanan P.J., **Reynolds M.T.**, Filippenko A.V., Garnavich P.M., Foley R.J., On the Present and Future of Pulsar Astronomy, 26<sup>th</sup> meeting of the IAU, Joint Discussion 2, 16-17 August, 2006, Prague, Czech Republic, JD02, 58
5. "Keck IR Observation of GRO J0422+32 in Quiescence"  
**Reynolds M.T.**, Callanan P.J., Filippenko A.V., 2005, "A Life with stars" A meeting in honour of the 65<sup>th</sup> birthday of Ed van den Heuvel, eds Kapers, van der Klis, Wijers
6. "Optical Observations of IGR J00291+5934 in the Post Outburst Phase"  
**Reynolds M.T.**, Elebert P., Callanan P. J., Field B., Tuite, P., Torres, M.A.P., Steeghs, D., Garnavich, P.M., Terndrup D.M., Filippenko A.V., Foley R.J., Harlaftis E.T., Populations of High Energy Sources in Galaxies

Proceedings of the 230th Symposium of the International Astronomical Union, Held in Dublin, Ireland 15-19 August 2005, Edited by E. J. A. Meurs; G. Fabbiano. Cambridge: Cambridge University Press, 2006., pp.80-81

7. “The Optical & IR Lightcurve of PSR B1957+20”  
**Reynolds M.T.**, Callanan P.J., Fruchter, A.S., Torres M.A.P., Beer M.E., Gibbons R.A., Populations of High Energy Sources in Galaxies Proceedings of the 230th Symposium of the International Astronomical Union, Held in Dublin, Ireland 15-19 August 2005, Edited by E. J. A. Meurs; G. Fabbiano. Cambridge: Cambridge University Press, 2006., pp.55-56
8. “The Light Curve of the Companion to PSR B1957+20”  
**Reynolds M.T.**, Callanan P.J., Fruchter, A.S., Torres M.A.P., Beer M.E., Gibbons R.A., INTERACTING BINARIES: Accretion, Evolution, and Outcomes. AIP Conference Proceedings, Volume 797, pp. 607-610

### Circulars:

1. “Broad Relativistic Iron Line Observed in SAX J1808.4-3658 by Suzaku”  
Cackett E., Altamirano D., Miller J., **Reynolds M.**, Blum J., Linares M., Patruno A., Wijnands R., 2008, ATel, 1844.
2. “ESO VLT Spectral Observations of SAX J1808.4-3658 in Outburst”  
Ramsay G., Elebert P., Callanan P., **Reynolds M.**, Hakala P., 2008, ATel, 1752.
3. “Possible Near-Infrared Counterpart to the Galactic Transient 1RXH J173523.7-354013”  
Cackett E., Wijnands R., **Reynolds M.**, 2008, ATel, 1601.
4. “Optical measurements of HETE J1900.1-2455 with the Large Binocular Telescope”  
Garnavich P.M., Callanan P.J., Elebert P., **Reynolds M.T.**, 2007, The Astronomer’s Telegram, #1110