

# Dr. Robert F. Archibald

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**Research Interests:** Observational astrophysics, magnetars, pulsar timing, astrophysical transients, X-ray astronomy

## Education

- 2017 **McGill University** *Ph.D.* (Physics)  
Thesis Supervisor: Prof. V. M. Kaspi  
Thesis Title: X-ray Timing of Young Pulsars
- 2014 **McGill University** *M.Sc.* (Physics)  
Thesis Supervisor: Prof. V. M. Kaspi  
Thesis Title: An Anti-glitch in a magnetar
- 2011 **Dalhousie University** *B.Sc.* (Honours Physics)  
Thesis Supervisor: Prof. J. Kyriakidis  
Thesis Title: Factoring by Adiabatic Quantum Computation

## Employment

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|---------------------|------------------------------|---|
| Sept 2017 - Present | <b>University of Toronto</b> | Postdoctoral Fellow                                 |
| 2011–16             | <b>McGill University</b>     | Teaching Assistant                                  |
| May-Aug 2011        | <b>McGill University</b>     | Research Associate<br>Victoria Kaspi                |
| May-Aug 2010        | <b>Dalhousie University</b>  | NSERC Summer Student<br>Jeff Pierce                 |
| May-Aug 2009        | <b>Dalhousie University</b>  | NSERC Summer Student<br>Laurent Kreplak             |
| May-Aug 2008        | <b>Dalhousie University</b>  | Burgess McKittrick Summer Student<br>Richard Dunlap |

## Awards

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|---------|---|
| 2017–19 | NSERC Postdoctoral Fellowship                           |
| 2014–17 | NSERC Alexander Graham Bell Canada Graduate Scholarship |
| 2013–15 | Walter C. Sumner Foundation Fellowship                  |
| 2012–13 | Alexander McFee Fellowship                              |
| 2011–13 | R.H. Tomlinson Masters Fellowship                       |
| 2011–12 | NSERC Canada Graduate Scholarship Masters               |
| 2011–12 | Reinhardt C. Fellowship                                 |
| 2011–12 | Lorne Trottier Fellowship                               |

## Teaching & Mentoring

2016	Guest lecturer in <i>Physics of Music</i> course
2015	Co-Supervised (with V. Kaspi) undergraduate student for a summer project. Kays Haddad: Magnetar-like X-ray Bursts From High Magnetic Field Pulsars
2014	Designed new observing projects for first year Astronomy course
2014–16	Mentor in McGill Physics Department Mentorship Program
2011–16	Teaching assistant, tutorial leader, and laboratory instructor in Physics Department at McGill

## Outreach Activities & Service

2017	<ul style="list-style-type: none"><li>• Organizer &amp; volunteer coordinator for <i>AstroKids</i> night<ul style="list-style-type: none"><li>– ~ 150 children attended</li></ul></li></ul>
2016–17	<ul style="list-style-type: none"><li>• Graduate Student Representative, Astro-McGill Steering Committee</li></ul>
2016	<ul style="list-style-type: none"><li>• Guest Science Expert, Finding Stuff Out, TV Ontario<ul style="list-style-type: none"><li>– To air in 2017 Winter</li></ul></li></ul>
2016	<ul style="list-style-type: none"><li>• Referee for <i>ApJL</i>, <i>MNRAS</i> &amp; <i>A&amp;A</i></li></ul>
2016	<ul style="list-style-type: none"><li>• Organized &amp; executed observations on Mount Royal for the Mercury Transit<ul style="list-style-type: none"><li>– ~ 100 people reached</li></ul></li></ul>
2016	<ul style="list-style-type: none"><li>• Team leader for McGill Space Explorers<ul style="list-style-type: none"><li>– Helped design interactive science activities and visited same Grade 4 class five times over the school year</li></ul></li></ul>
2012–16	<ul style="list-style-type: none"><li>• Elementary School Activity Leader, Astro-McGill<ul style="list-style-type: none"><li>– ~2 classes/after-school groups per semester</li></ul></li></ul>
2012–17	<ul style="list-style-type: none"><li>• Organize talks and operate telescopes for monthly Astro-McGill’s Public Astro Night<ul style="list-style-type: none"><li>– Grew from ~60/month to ~400/month audience</li></ul></li></ul>
2013–15	<ul style="list-style-type: none"><li>• McGill Graduate Association of Physics Students VP Finance</li></ul>
2012–13	<ul style="list-style-type: none"><li>• McGill Graduate Association of Physics Students VP Academic</li></ul>
2012	<ul style="list-style-type: none"><li>• Organizing committee for Centre de Recherche en Astrophysique du Québec student workshop</li></ul>

## Talks & Posters

2017	Talk	<i>Radio silencing magnetar bursts</i> Pulsar Astrophysics: The Next Fifty Years IAU Symposium 337; Jodrell Bank, UK (Sept 2017)
2016	Talk	<i>Magnetars: an observational overview</i> JINA CEE: Neutron Stars in Multi-Messenger Era: Prospects and Challenges; Athens, Ohio USA (May 2016)
	Talk	<i>Spin-down glitches in magnetars</i> Capitol Chats II: Magnetars, What are they?; Washington D.C., USA (July 2016)
	Talk	<i>Persistent emission properties of magnetars</i> Capitol Chats II: Magnetars, What are they?; Washington D.C., USA (July 2016)
	Poster	<i>Unusual Braking Indices in Young Pulsars</i> AAS High Energy Astrophysics Division; Naples Florida, USA (April 2016)
2015	Talk	<i>Un changement permanent dans l’indice de freinage de PSR J1846–0258</i> Rencontre annuelle du Centre de Recherche en Astrophysique du Québec; Quebec, Canada (May 2015)

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| 2014 | Talk | <i>Repeated, delayed torque instabilities following flux enhancement in the Magnetar 1E 1048.1–5937</i> The Structure and Signals of Neutron Stars, from Birth to Death; Florence, Italy (March 2014) |
| 2013 | Talk | <i>An anti-glitch in the magnetar 1E 2259+586</i> NS2013:Latest Results From The Neutron-Star Laboratory; Amsterdam, Netherlands (May 2013)   |
|      | Talk | <i>An anti-glitch in the magnetar 1E 2259+586</i> AAS High Energy Astrophysics Division; Monterey, California, USA (April 2013)   |

## Summary of Publications

21 Refereed manuscripts,  $\geq 330$  citations,  $h$ -index = 12

## Refereed Publications

- 2017    xxi    **R.F. Archibald**, M. Burgay, M. Lyutikov, V. M. Kaspi, P. Esposito, G. Israel, M. Kerr, A. Possenti, N. Rea, J. Sarkissian, P. Scholz, and S. P. Tendulkar. Magnetar-like X-ray bursts suppress pulsar radio emission. *The Astrophysical Journal Letters*, *accepted.*, Oct. 2017
- xx    **R.F. Archibald**, V. M. Kaspi, P. Scholz, A. P. Beardmore, N. Gehrels, and J. A. Kennea. SWIFT Observations of Two Outbursts from the Magnetar 4U0142+61. *The Astrophysical Journal*, 834:163, Jan. 2017
- xix    S. P. Tendulkar, V. M. Kaspi, **R.F. Archibald**, and P. Scholz. Near Infrared Counterpart of 2E 1613.5-5053, the Central Source in Supernova Remnant RCW 103. *The Astrophysical Journal*, 841:11, May 2017
- 2016    xviii    **R.F. Archibald**, V. M. Kaspi, S. P. Tendulkar, and P. Scholz. A Magnetar-like Outburst from a High-B Radio Pulsar. *The Astrophysical Journal Letters*, 829:L21, Sept. 2016
- xvii    **R.F. Archibald**, E. V. Gotthelf, R. D. Ferdman, V. M. Kaspi, S. Guillot, F. A. Harrison, E. F. Keane, M. J. Pivovarov, D. Stern, S. P. Tendulkar, and J. A. Tomsick. A High Braking Index for a Pulsar. *The Astrophysical Journal Letters*, 819:L16, Mar. 2016
- xvi    S. Guillot, V. M. Kaspi, **R.F. Archibald**, M. Bachetti, C. Flynn, F. Jankowski, M. Bailes, S. Boggs, F. E. Christensen, W. W. Craig, C. A. Hailey, F. A. Harrison, D. Stern, and W. W. Zhang. The NuSTAR view of the non-thermal emission from PSR J0437–4715. *Monthly Notices of the Royal Astronomical Society*, 463:2612–2622, Dec. 2016
- xv    C. Yang, **R.F. Archibald**, J. K. Vogel, H. An, V. M. Kaspi, S. Guillot, A. M. Beloborodov, and M. Pivovarov. NuSTAR Observations of Magnetar 1E 1048.1–5937. *The Astrophysical Journal*, 831:80, Nov. 2016
- 2015    xiv    **R.F. Archibald**, V. M. Kaspi, C.-Y. Ng, P. Scholz, A. P. Beardmore, N. Gehrels, and J. A. Kennea. Repeated, Delayed Torque Variations Following X-Ray Flux Enhancements in the Magnetar 1E 1048.1–5937. *The Astrophysical Journal*, 800:33, Feb. 2015
- xiii    **R.F. Archibald**, V. M. Kaspi, A. P. Beardmore, N. Gehrels, and J. A. Kennea. On the Braking Index of the Unusual High-B Rotation-Powered Pulsar PSR J1846–0258. *The Astrophysical Journal*, 810:67, Sept. 2015
- xii    R. D. Ferdman, **R.F. Archibald**, and V. M. Kaspi. Long-term Timing and Emission Behavior of the Young Crab-like Pulsar PSR B0540–69. *The Astrophysical Journal*, 812:95, Oct. 2015

- xi R. S. Lynch, **R.F. Archibald**, V. M. Kaspi, and P. Scholz. Green Bank Telescope and Swift X-Ray Telescope Observations of the Galactic Center Radio Magnetar SGR J17451–2900. *The Astrophysical Journal*, 806:266, June 2015
- x H. An, **R.F. Archibald**, R. Hascoët, V. M. Kaspi, A. M. Beloborodov, A. M. Archibald, A. Beardmore, S. E. Boggs, F. E. Christensen, W. W. Craig, N. Gehrels, C. J. Hailey, F. A. Harrison, J. Kennea, C. Kouveliotou, D. Stern, G. Younes, and W. W. Zhang. Deep NuSTAR and Swift Monitoring Observations of the Magnetar 1E 1841–045. *The Astrophysical Journal*, 807:93, July 2015
- 2014 ix V. M. Kaspi, **R.F. Archibald**, V. Bhalerao, F. Dufour, E. V. Gotthelf, H. An, M. Bachetti, A. M. Beloborodov, S. E. Boggs, F. E. Christensen, W. W. Craig, B. W. Grefenstette, C. J. Hailey, F. A. Harrison, J. A. Kennea, C. Kouveliotou, K. K. Madsen, K. Mori, C. B. Markwardt, D. Stern, J. K. Vogel, and W. W. Zhang. Timing and Flux Evolution of the Galactic Center Magnetar SGR J1745–2900. *The Astrophysical Journal*, 786:84, May 2014
- viii H. An, V. M. Kaspi, **R.F. Archibald**, M. Bachetti, V. Bhalerao, E. C. Bellm, A. M. Beloborodov, S. E. Boggs, D. Chakrabarty, F. E. Christensen, W. W. Craig, F. Dufour, K. Forster, E. V. Gotthelf, B. W. Grefenstette, C. J. Hailey, F. A. Harrison, R. Hascoët, T. Kitaguchi, C. Kouveliotou, K. K. Madsen, K. Mori, M. J. Pivovarov, V. R. Rana, D. Stern, S. Tendulkar, J. A. Tomsick, J. K. Vogel, W. W. Zhang, and NuSTAR Team. NuSTAR results and future plans for magnetar and rotation-powered pulsar observations. *Astronomische Nachrichten*, 335:280–284, Mar. 2014
- vii P. Scholz, **R.F. Archibald**, V. M. Kaspi, C.-Y. Ng, A. P. Beardmore, N. Gehrels, and J. A. Kennea. On the X-Ray Variability of Magnetar 1RXS J170849.0–400910. *The Astrophysical Journal*, 783:99, Mar. 2014
- vi H. An, V. M. Kaspi, A. M. Beloborodov, C. Kouveliotou, **R.F. Archibald**, S. E. Boggs, F. E. Christensen, W. W. Craig, E. V. Gotthelf, B. W. Grefenstette, C. J. Hailey, F. A. Harrison, K. K. Madsen, K. Mori, D. Stern, and W. W. Zhang. NuSTAR Observations of X-Ray Bursts from the Magnetar 1E 1048.1–5937. *The Astrophysical Journal*, 790:60, July 2014
- v J. K. Vogel, R. Hascoët, V. M. Kaspi, H. An, **Archibald, R. F.**, A. M. Beloborodov, S. E. Boggs, F. E. Christensen, W. W. Craig, E. V. Gotthelf, B. W. Grefenstette, C. J. Hailey, F. A. Harrison, J. A. Kennea, K. K. Madsen, M. J. Pivovarov, D. Stern, and W. W. Zhang. NuSTAR Observations of the Magnetar 1E 2259+586. *The Astrophysical Journal*, 789:75, July 2014

2013	iv	<b>R.F. Archibald</b> , V. M. Kaspi, C.-Y. Ng, K. N. Gourgouliatos, D. Tsang, P. Scholz, A. P. Beardmore, N. Gehrels, and J. A. Kennea. An anti-glitch in a magnetar. <i>Nature</i> , 497:591–593, May 2013
	iii	H. An, V. M. Kaspi, <b>R.F. Archibald</b> , and A. Cumming. Spectral and Timing Properties of the Magnetar CXOU J164710.2–455216. <i>The Astrophysical Journal</i> , 763:82, Feb. 2013
	ii	H. An, R. Hascoët, V. M. Kaspi, A. M. Beloborodov, F. Dufour, E. V. Gotthelf, <b>R.F. Archibald</b> , M. Bachetti, S. E. Boggs, F. E. Christensen, W. W. Craig, B. W. Greffenstette, C. J. Hailey, F. A. Harrison, T. Kitaguchi, C. Kouveliotou, K. K. Madsen, C. B. Markwardt, D. Stern, J. K. Vogel, and W. W. Zhang. NuSTAR Observations of Magnetar 1E 1841–045. <i>The Astrophysical Journal</i> , 779:163, Dec. 2013
2012	i	P. Scholz, C.-Y. Ng, M. A. Livingstone, V. M. Kaspi, A. Cumming, and <b>R.F. Archibald</b> . Post-outburst X-Ray Flux and Timing Evolution of Swift J1822.3–1606. <i>The Astrophysical Journal</i> , 761:66, Dec. 2012

### Unrefereed Publications

2017		The Astronomer’s Telegram, No. 10576, <i>Swift XRT Observation of the Magnetar 4U 0142+61 Following a Burst</i> , <b>R.F. Archibald</b> , Kaspi, V., Scholz, P., and Tendulkar, S
		The Astronomer’s Telegram, No. 10107, <i>A magnetar-like burst from 1RXS J170849.0–400910</i> , <b>R.F. Archibald</b> , Scholz, P., and Kaspi, V.
2016		The Astronomer’s Telegram, No. 8868, <i>Swift XRT Observations of SGR J0755-2933</i> , <b>R.F. Archibald</b> , Scholz, P., and Kaspi, V.
		The Astronomer’s Telegram, No. 9378, <i>Fermi-LAT TOO observations of PSR J1119-6127 following its 2016 magnetar-like outburst</i> , G. Younes, <b>R.F. Archibald</b> , C. Kouveliotou, V. Kaspi, and P.S. Ray for the Fermi LAT Collaboration
		The Astronomer’s Telegram, No. 9284, <i>Glitch observation and hard X-ray power law measurement in PSR J1119-6127</i> , <b>R.F. Archibald</b> , Tendulkar, S.P., Scholz, P., and Kaspi, V.
		The Astronomer’s Telegram, No. 9316, <i>New Outburst of the Magnetar 1E 1048.1-5937</i> , <b>R.F. Archibald</b> , Tendulkar, S.P., Scholz, P., and Kaspi, V.
2015		The Astronomer’s Telegram, No. 7171, <i>Swift XRT Observations of the Magnetar 4U 0142+61</i> , <b>R.F. Archibald</b> , Scholz, P., Kaspi, V., N. Gehrels, and J. Kennea.
2013		The Astronomer’s Telegram, No. 5420, <i>Swift XRT Observation of 1E 1841-045</i> , <b>R.F. Archibald</b> , Scholz, P., and Kaspi, V.
2012		The Astronomer’s Telegram, No. 4080, <i>X-ray Flux Enhancement from 1E 2259+586 in Swift XRT Monitoring</i> , <b>R.F. Archibald</b> , V. M. Kaspi, A. P. Beardmore, N. Gehrels, and J. Kennea

2011

The Astronomer's Telegram, No. 3520, *Swift/XRT Observations of Anomalous X-ray Pulsar 4U 0142+61 Following a Burst*, F. P. Gavriil, V. M. Kaspi, M. A. Livingstone, P. Scholz, and **R.F. Archibald**