

# MAXIME BRODEUR

The University of Notre Dame,  
Department of Physics,  
213 Nieuwland Science Hall,  
Notre Dame, IN, 46556, U.S.A.  
Phone: 1-574-631-8204  
Fax: 1-574-631-5952  
e-mail: mbrodeur@nd.edu

## Personal

Citizenship: Canadian  
Gender: Male  
Languages: French, English

## Education

Ph.D. (Physics) The University of British Columbia, Vancouver, Canada, 2006-2010  
M.Sc. (Physics) The University of British Columbia, Vancouver, Canada, 2004-2006  
B.Sc. (Physics) L'Université de Montréal, Montréal, Canada, 2000-2003

## Appointments

Assistant Professor      The University of Notre Dame, Notre Dame, USA, 2013-  
Research Associate      NSCL at Michigan State University, East Lansing, USA, 2010-2013  
Teaching Assistant      The University of British Columbia, Vancouver, Canada, 2004-2010

## Awards

Named the Notre Dame Ortenzio Family Assistant Professor, 2015  
TRIUMF Carl Westcott Fellowship, 2008  
The University of British Columbia Graduate Fellowship, 2008

## Membership

American Physical Society; Division of Nuclear Physics and Few-Body Systems Topical Group  
Canadian Society for Mass Spectrometry

## Experimental proposals

1. **M. Brodeur, *High precision mass measurements of  $^{52}\text{Co}$  and  $^{56}\text{Cu}$  for the astrophysical rp-process***, NSCL PAC40 #16037, accepted (119 h). (2016)
2. **M. Brodeur, T. Brunner, and J. Dilling, *Detailed studies of halo nuclei close to the neutron drip-line***, TRIUMF letter of intent #S1621-LOI, accepted with first priority. (2016)
3. **M. Brodeur, and A. Kankainen, *Mass measurements for the astrophysical rapid neutron capture process***, JYFL PAC, Fall 2014, Exp. I204, completed. (2014)
4. **M. Brodeur, *High precision mass measurements for the astrophysical rp-process***, NSCL PAC38 #14016, completed (71 h). (2014)
5. **M. Brodeur, D. Lunney, and J. Dilling, *Investigating the apparent disappearance of the  $N = 28$  shell closure***, TRIUMF exp #S1290, re-accepted with medium priority. (2014)

6. **M. Brodeur**, S. Ettenauer and A. Gallant, ***High precision mass measurements of neutron-deficient calcium***, TRIUMF letter of intent #S1460-LOI, accepted priority 2.
7. **M. Brodeur**, V.V. Simon and J. Dilling, ***Precise mass measurements of Sr and Rb isotopes in the vicinity of the r-process path***, TRIUMF exp #S1373, accepted with high priority.
8. **M. Brodeur**, B.A. Brown and J. Dilling, ***Testing the IMME through the high-precision mass measurements of <sup>20,21</sup>Mg***, TRIUMF exp #S1374, completed.

#### **Organizer**

1. M. Brodeur and M. Couder, ***2015 Annual Fall Meeting of the APS Prairie Section***, co-organizer for the conference, Notre Dame, IN, USA, 2015
2. M. Brodeur and M. Redshaw, ***Masses in traps***, Discussion leader at the Gordon Research Conference in Nuclear Chemistry, New London, NH, USA, 2015
3. M. Brodeur and P. Schury, ***Developments in confinement techniques for precision low-energy nuclear physics experiments with radioactive ion beam***, co-organizer, 1/2 day workshop at the DNP-JPS Joint Meeting, Hilton Waikoloa Village, Big Island, USA, 2014

#### **External committee**

1. Expert reviewer for a research grant proposal in nuclear physics submitted to the National Science Foundation. (2016)
2. Expert reviewer for a research grant proposal submitted to the French funding agency “Agence Nationale de la Recherche”. (2015)
3. Part of the review panel for the “Etablissement de nouveaux chercheur universitaires” research grants. These are research grants for new faculty members given by Quebec’s research fund in science and technology (FRQNT). (2015)

#### **Reviewer**

Peer-reviewed manuscripts submitted to AIP Advances, Nuclear Physics A, European Physical Journal A, Nuclear Instrumentation and Methods.

#### **Mentoring**

##### **Undergraduate students:**

1. Shane Ryan, Summer - Fall 2015
2. Alec Hamaker, REU Summer 2015
3. Guillermo Bustos Ramirez, REU Summer 2014
4. Catherine Nicholoff, REU Summer 2014 – Fall 2015

##### **Graduate students:**

1. James Kelly, 2014-
2. Jacob Long, 2015-
3. Daniel Burdette, 2016-

##### **Post-doctoral fellows:**

1. Brad Schultz, 2014-

**Publications** (h-index: 14)

**Published, peer reviewed**

1. A. Hamaker, **M. Brodeur**, J. Kelly, J. Long, C. Nikoloff, S. Ryan, B.E. Schultz, P. Schury, M. Wada, *Experimental investigation of the repelling force from RF carpets*, Int. J of Mass Spect. **404**, 14 (2016).
2. T. Ahn, D. W. Bardayan, D. Bazin, S. Beceiro Novo, F. D. Becchetti, J. Bradt, **M. Brodeur**, L. Carpenter, Z. Chajecski, M. Cortesi, A. Fritsch, M. R. Hall, O. Hall, L. Jensen, J. J. Kolata, W. Lynch, W. Mittig, P. O'Malley, D. Suzuki, *The Prototype Active-Target Time-Projection Chamber used with TwinSol Radioactive-Ion Beam*, Nucl. Inst. Meth. B **376**, 321 (2016).
3. **M. Brodeur**, J. Kelly, J. Long, C. Nicoloff, B. Schultz,  *$V_{ud}$  determination from light nuclide mirror transitions*, Nucl. Inst. Meth. B **376**, 281 (2016).
4. B.E. Schultz, J. Kelly, C. Nikoloff, J. Long, S. Ryan, **M. Brodeur**, *A Multi-Reflection Time-of-Flight Mass Spectrometer for Isobaric Purification at the University of Notre Dame*, Nucl. Inst. Meth. B **376**, 251 (2016).
5. A.E. Gehring, **M. Brodeur**, G. Bollen, D.J. Morrissey, S. Schwarz, *Research and Development of Ion Surfing RF Carpets for the Cyclotron Gas Stopper at the NSCL*, Nucl. Inst. Meth. B **376**, 221 (2016).
6. R. Klawitter, A. Bader, **M. Brodeur**, U. Chowdhury, A. Chaudhuri, J. Fallis, A.T. Gallant, A. Grossheim, A.A. Kwiatkowski, D. Lascar, K.G. Leach, A. Lennarz, T.D. Macdonald, J. Parkes, S. Seeraji, M.C. Simon, V.V. Simon, B.E. Schultz, J. Dilling, *Mass measurements of neutron-rich Rb and Sr isotopes*, Phys. Rev. C **93**, 045807 (2016).
7. **M. Brodeur**, C. Nicoloff, T. Ahn, J. Allen, D.W. Bardayan, F.D. Becchetti, Y.K. Gupta, M.R. Hall, O. Hall, J. Hu, J.M. Kelly, J.J. Kolata, J. Long, P. O'Malley, and B.E. Schultz, *Precision half-life measurement of  $^{17}\text{F}$* , Phys. Rev. C **93**, 025503 (2016).
8. K. Gulyuz, G. Bollen, **M. Brodeur**, R.A. Bryce, K. Cooper, M. Eibach, C. Izzo, E. Kwan, K. Manukyan, D.J. Morrissey, O. Naviliat-Cuncic, M. Redshaw, R. Ringle, R. Sandler, S. Schwarz, C.S. Sumithrarachchi, A. A. Valverde, and A.C.C. Villari, *High precision determination of the  $\beta$ -decay  $Q_{EC}$  value of  $^{11}\text{C}$  and implications on the tests of the standard model*, Phys. Rev. Lett. **116**, 012501 (2016).
9. U. Chowdhury, K.G. Leach, C. Andreoiu, A. Bader, **M. Brodeur**, A. Chaudhuri, A.T. Gallant, A. Grossheim, G. Gwinner, R. Klawitter, A.A Kwiatkowski, A. Lennarz, T.D. Macdonald, J. Parkes, B.E. Schultz, and J. Dilling, *First direct mass measurement of the neutron-deficient nucleus  $^{24}\text{Al}$* , Phys. Rev. C **92**, 045803 (2015).
10. M. Eibach, G. Bollen, **M. Brodeur**, K. Cooper, K. Gulyuz, C. Izzo, D.J. Morrissey, M. Redshaw, R. Ringle, R. Sandler, S. Schwarz, C.S. Sumithrarachchi, A.A. Valverde, and A.C.C. Villari, *Determination of the  $Q_{EC}$  values of the  $T = 1/2$  mirror nuclei  $^{21}\text{Na}$  and  $^{29}\text{P}$  at LEBIT*, Phys. Rev. C **92**, 045502 (2015).
11. A. A. Valverde, G. Bollen, **M. Brodeur**, R. A. Bryce, K. Cooper, M. Eibach, K. Gulyuz, C. Izzo, D. J. Morrissey, M. Redshaw, R. Ringle, R. Sandler, S. Schwarz, C. S.

- Sumithrarachchi, A. C. C. Villari, **First Direct Determination of the Superallowed  $\beta$ -Decay  $Q_{EC}$  Value for  $^{14}\text{O}$** , Phys. Rev. Lett. **114**, 232502 (2015).
12. S. Malbrunot-Ettenauer, T. Brunner, U. Chowdhury, A. T. Gallant, V. V. Simon, **M. Brodeur**, A. Chaudhuri, E. Mané, M. C. Simon, C. Andreoiu, G. Audi, J. R. Crespo López-Urrutia, P. Delheij, G. Gwinner, A. Lapierre, D. Lunney, M. R. Pearson, R. Ringle, J. Ullrich, and J. Dilling, **Penning trap mass measurements utilizing highly charged ions as a path to benchmark isospin-symmetry breaking corrections in  $^{74}\text{Rb}$** , Phys. Rev. C **91**, 045504 (2015).
  13. A.T. Gallant, **M. Brodeur**, C. Andreoiu, A. Bader, A. Chaudhuri, U. Chowdhury, A. Grossheim, R. Klawitter, A.A. Kwiatkowski, K.G. Leach, A. Lennarz, T. D. Macdonald, B.E. Schultz, J. Lassen, H. Heggen, S. Raeder, A. Teigelhofer, B.A Brown, A. Magilligan, J.D. Holt, J. Menendez, J. Simonis, A. Schwenk, J. Dilling, **Breakdown of the Isobaric Multiplet Mass Equation for the  $A=20$  and  $21$  Multiplets**, Phys. Rev. Lett. **113**, 082501 (2014).
  14. B.E. Schultz, **M. Brodeur**, C. Andreoiu, A. Bader, A. Chaudhuri, U. Chowdhury, A.T. Gallant, A. Grossheim, R. Klawitter, A.A. Kwiatkowski, K.G. Leach, A. Lennarz, T.D. Macdonald, J. Lassen, H. Heggen, S. Raeder, A. Teigelhofer, A. and J. Dilling, **Precision  $Q_{EC}$ -value measurement of  $^{23}\text{Mg}$  for testing the Cabibbo-Kobayashi-Maskawa matrix unitarity**, Phys. Rev. C Rapid Comm. **90**, 012501 (2014).
  15. A. Chaudhuri, C. Andreoiu, **M. Brodeur**, T. Brunner, U. Chowdhury, S. Ettenauer, A.T. Gallant, A. Grossheim, G. Gwinner, R. Klawitter, A.A. Kwiatkowski, K.G. Leach, A. Lennarz, D. Lunney, T.D. Macdonald, R. Ringle, B.E. Schultz, V.V. Simon, M.C. Simon, J. Dilling, **An ion trap for accurate mass measurements of ms-half-life nuclides**, Applied Physics B **114**, 99 (2014).
  16. S. Schwarz, G. Bollen, **M. Brodeur**, S.S. Chouhan, J. DeKamp, A.E. Gehring, N.S. Joshi, C. Magsig, D.J. Morrissey, R. Ringle, J. Ottarson, A.F. Zeller, **The NSCL cyclotron gas stopper – Under construction**, Nucl. Inst. Meth. B **317**, 463 (2013).
  17. **M. Brodeur**, N. Joshi, A.E. Gehring, G. Bollen, D.J. Morrissey, and S. Schwarz, **Traveling wave ion transport for the cyclotron gas stopper**, Nucl. Inst. Meth. B **317**, 468 (2013).
  18. S. Bustabad, G. Bollen, **M. Brodeur**, D.L. Lincoln, S. J. Novario, M. Redshaw, R. Ringle, and S. Schwarz, **Examination of the possible enhancement of neutrinoless double-electron capture in  $^{78}\text{Kr}$** , Phys. Rev. C **88**, 035502 (2013).
  19. M.C. Simon, T.D. Macdonald, J.C. Bale, A. Chowdhury, B. Eberhardt, M. Eibach, A.T. Gallant, F. Jang, A. Lennarz, M. Luicht, T. Ma, D. Robertson, V.V. Simon, C. Andreoiu, **M. Brodeur**, T. Brunner, A. Chaudhuri, J.R. Crespo Lopez-Urrutia, P. Delheij, S. Ettenauer, D. Frekers, A. Grossheim, G. Gwinner, A.A. Kwiatkowski, A. Lapierre, E. Mane, M.R. Pearson, R. Ringle, B.E. Schultz and J. Dilling, **Charge breeding rare isotopes for high precision mass measurements: challenges and opportunities**, Phys. Script. **T156**, 014098 (2013).
  20. S. Bustabad, G. Bollen, **M. Brodeur**, D.L. Lincoln, S. J. Novario, M. Redshaw, R. Ringle, S. Schwarz, and A.A. Valverde, **First Direct determination of the  $^{48}\text{Ca}$  double- $\beta$  decay  $Q$ -value**, Phys. Rev. C **88**, 022501(R) (2013).
  21. D. Frekers, M. C. Simon, C. Andreoiu, J. C. Bale, **M. Brodeur**, T. Brunner, A. Chaudhuri, U. Chowdhury, J. R. Crespo Lopez-Urrutia, P. Delheij, H. Ejiri, S. Ettenauer, A. T. Gallant, V. Gavrin, A. Grossheim, M. N. Harakeh, F. Jang, A. A. Kwiatkowski, J. Lassen, A. Lennarz, M. Luichtl, T. Ma, T. D. Macdonald, E. Mane, D. Robertson, B. E. Schultz, V. V.

- Simon, A. Teigelhofer, and J. Dilling, ***Penning-trap Q-value determination of the  $^{71}\text{Ga}(n,e)^{71}\text{Ge}$  reaction using threshold charge breeding of on-line produced isotopes***, Phys. Lett. B **722**, 233 (2013).
22. **M. Brodeur**, A.E. Gehring, G. Bollen, S. Schwarz, and D.J. Morrissey, ***Experimental investigation of the ion surfing transport method***, Int. J of Mass Spect. **336**, 53 (2013).
  23. D. L. Lincoln, J. D. Holt, G. Bollen, **M. Brodeur**, S. Bustabad, J. Engel, S. J. Novario, M. Redshaw, R. Ringle and S. Schwarz, ***First Direct Double- $\beta$  Decay Q-value Measurement of  $^{82}\text{Se}$  in Support of Understanding the Nature of the Neutrino***, Phys. Rev. Lett. **110**, 012501 (2013).
  24. T. Brunner, A. Lapierre, C. Andreoiu, **M. Brodeur**, P. Delheji, S. Ettenauer, D. Frekers, A.T. Gallant, R. Gernhauser, A. Grossheim, R. Krucken, A. Lennarz, D. Lunney, D. Mucher, R. Ringle, M.C. Simon, V.V. Simon, S.K.L. Sjue, K. Zuber, and J. Dilling, ***Trapped-ion decay spectroscopy towards the determination of ground-state components of double-beta decay elements***, Eur. Phys. J. A **49**, 142 (2013).
  25. M. Redshaw, G. Bollen, **M. Brodeur**, S. Bustabad, D.L. Lincoln, S.J. Novario, R. Ringle, and S. Schwarz, ***Atomic Mass and Double Beta-Decay Q-value of  $^{48}\text{Ca}$*** , Phys. Rev. C Rapid Comm. **86**, 041306 (2012).
  26. T. Brunner, M.J. Smith, **M. Brodeur**, S. Ettenauer, A.T. Gallant, V.V. Simon, A. Chaudhuri, A. Lapierre, E. Mané, R. Ringle, M.C. Simon, J.A. Vaz, P. Delheij, M. Good, M.R. Pearson, and J. Dilling, ***TITAN's Digital RFQ Ion Beam Cooler and Buncher, Operation and Performance***, Nucl. Instr. and Meth. A **676**, 32 (2012).
  27. **M. Brodeur**, T. Brunner, S. Ettenauer, A. Lapierre, R. Ringle, B.A. Brown, D. Lunney, J. Dilling, ***Elucidation of the anomalous  $A = 9$  isospin quartet behavior***, Phys. Rev. Lett. **108**, 212501 (2012).
  28. A. T. Gallant, **M. Brodeur**, T. Brunner, U. Chowdhury, S. Ettenauer, V. V. Simon, E. Mané, M.C. Simon, C. Andreoiu, P. Delheij, G. Gwinner, M. R. Pearson, R. Ringle, J. Dilling, ***Highly charged ions in Penning traps, a new tool for resolving low lying isomeric states***, Phys. Rev. C **85**, 044311 (2012).
  29. A. Lapierre, **M. Brodeur**, T. Brunner, S. Ettenauer, P. Finlay, A. T. Gallant, V. V. Simon, P. Delheij, D. Lunney, R. Ringle, H. Savajols, J. Dilling, ***Penning-Trap Mass Measurements of the Neutron-Rich K and Ca Isotopes: Resurgence of the  $N = 28$  Shell Strength***, Phys. Rev. C **85**, 024317 (2012).
  30. M. C. Simon, J. C. Bale, U. Chowdhury, B. Eberhardt, S. Ettenauer, A. T. Gallant, F. Jang, A. Lennarz, M. Luichtl, T. Ma, D. Robertson, V. V. Simon, C. Andreoiu, **M. Brodeur**, T. Brunner, A. Chaudhuri, J. R. Crespo López-Urrutia, P. Delheij, D. Frekers, A. Grossheim, G. Gwinner, A. A. Kwiatkowski, A. Lapierre, E. Mané, M. R. Pearson, R. Ringle, B. E. Schultz, and J. Dilling, ***The on-line charge breeding program at TRIUMF's Ion Trap For Atomic and Nuclear Science for precision mass measurements***, Rev. Sci. Instrum. **83**, 02A912 (2012).
  31. **M. Brodeur**, T. Brunner, C. Champagne, S. Ettenauer, M. J. Smith, A. Lapierre, R. Ringle, V. L. Ryjkov, S. Bacca, P. Delheij, G. W. F. Drake, D. Lunney, A. Schwenk, J. Dilling, ***First direct mass-measurement of the two-neutron halo nucleus  $^6\text{He}$  and improved mass for the four-neutron halo  $^8\text{He}$*** , Phys. Rev. Lett. **108**, 052504 (2012).
  32. **M. Brodeur**, V.L. Ryjkov, T. Brunner, S. Ettenauer, A.T. Gallant, V.V. Simon, M.J. Smith, A. Lapierre, R. Ringle, P. Delheij, M. Good, D. Lunney and J. Dilling, ***Verifying the***

- accuracy of the TITAN Penning-trap mass spectrometer**, Int. J of Mass Spect. **310**, 20 (2012).
33. S. Ettenauer, M. C. Simon, A. T. Gallant, T. Brunner, U. Chowdhury, V. V. Simon, **M. Brodeur**, A. Chaudhuri, E. Mané, C. Andreoiu, G. Audi, J. R. Crespo Lopez-Urrutia, P. Delheij, G. Gwinner, A. Lapiere, D. Lunney, M. R. Pearson, R. Ringle, J. Ullrich and J. Dilling, **First Use of High Charge States for Mass Measurements of Short-lived Nuclides in a Penning Trap**, Phys. Rev. Lett. **107**, 272501 (2011).
  34. **M. Brodeur**, T. Brunner, S. Ettenauer, A. T. Gallant, V. V. Simon, M. Smith, A. Lapiere, E. Mané, R. Ringle, V. L. Ryjkov, S. Bacca, P. Delheij, D. Lunney, M. Pearson and J. Dilling, **Precision mass measurements of neutron halo nuclei using the TITAN Penning trap**, Hyperfine Interact. **199**, 167 (2011).
  35. T. Brunner, **M. Brodeur**, P. Delheij, S. Ettenauer, D. Frekers, A. T. Gallant, R. Krücken, A. Lapiere, D. Lunney, R. Ringle, V. V. Simon and J. Dilling, **In-trap decay spectroscopy for  $2\nu\beta\beta$  decay experiments**, Hyperfine Interact. **199**, 191 (2011).
  36. E. Mané, J. A. Behr, J. Billowes, T. Brunner, **M. Brodeur**, F. Buchinger, J. E. Crawford, J. Dilling, S. Ettenauer, C. D. P. Levy, A. Voss and M. R. Pearson, **Collinear laser spectroscopy with reverse-extracted bunched beams at TRIUMF**, Hyperfine Interact. **199**, 357 (2011).
  37. A. Lapiere, **M. Brodeur**, T. Brunner, S. Ettenauer, A. T. Gallant, V. Simon, M. Good, M. W. Froese, J. R. Crespo López-Urrutia, P. Delheij, S. Epp, R. Ringle, S. Schwarz, J. Ullrich and J. Dilling, **The TITAN EBIT charge breeder for mass measurements on highly charged short-lived isotopes - First online operation**, Nucl. Instr. and Meth. A **624**, 54 (2010).
  38. A. T. Gallant, **M. Brodeur**, T. Brunner, S. Ettenauer, M. Good, A. Lapiere, R. Ringle, V. V. Simon, P. Delheij and J. Dilling, **TITAN-EBIT - charge breeding of radioactive isotopes for high precision mass measurements**, J. of Instr. **5**, C08009 (2010).
  39. D. Rodríguez, K. Blaum, W. Nörtershäuser, M. Ahammed, A. Algora, G. Audi, J. Äystö, D. Beck, M. Bender, J. Billowes, M. Block, C. Böhm, G. Bollen, **M. Brodeur**, T. Brunner, B. A. Bushaw, R. B. Cakirli, P. Campbell, D. Cano-Ott, G. Cortés, J. R. Crespo López-Urrutia, P. Das, A. Dax, A. De, P. Delheij, T. Dickel, J. Dilling, K. Eberhardt, S. Eliseev, S. Ettenauer, K. T. Flanagan, R. Ferrer, J.-E. García-Ramos, E. Gartzke, H. Geissel, S. George, C. Geppert, M. B. Gómez-Hornillos, Y. Gusev, D. Habs, P.-H. Heenen, S. Heinz, F. Herfurth, A. Herlert, M. Hobein, G. Huber, M. Huyse, C. Jesch, A. Jokinen, O. Kester, J. Ketelaer, V. Kolhinen, I. Koudriavtsev, M. Kowalska, J. Krämer, S. Kreim, A. Krieger, T. Kühl, A. M. Lallena, A. Lapiere, F. Le Blanc, Y. A. Litvinov, D. Lunney, T. Martínez, G. Marx, M. Matos, E. Minaya-Ramirez, I. Moore, S. Nagy, S. Naimi, D. Neidherr, D. Nesterenko, G. Neyens, Y. N. Novikov, M. Petrick, W. R. Plaß, A. Popov, W. Quint, A. Ray, P.-G. Reinhard, J. Repp, C. Roux, B. Rubio, R. Sánchez, B. Schabinger, C. Scheidenberger, D. Schneider, R. Schuch, S. Schwarz, L. Schweikhard, M. Seliverstov, A. Solders, M. Suhonen, J. Szerypo, J. L. Tañ, P. G. Thierolf, J. Ullrich, P. Van Duppen, A. Vasiliev, G. Vorobjev, C. Weber, K. Wendt, M. Winkler, D. Yordanov, F. Ziegler, **MATS and LaSpec: High-precision experiments using ion traps and lasers at FAIR**, Eur. Phys. J. Special Topics **183**, 1 (2010).
  40. S. Ettenauer, **M. Brodeur**, T. Brunner, A. T. Gallant, A. Lapiere, R. Ringle, M. R. Pearson, P. Delheij, J. Lassen, D. Lunney, and J. Dilling, **Precision ground state mass of  $^{12}\text{Be}$  and an isobaric multiplet mass equation (IMME) extrapolation for  $2^+$  and  $0^+_2$  states in the  $T = 2$ ,  $A = 12$  multiplet**, Phys. Rev. C **81**, 024314 (2010).

41. M. Brodeur, T. Brunner, C. Champagne, S. Ettenauer, M. Smith, A. Lapierre, R. Ringle, V. L. Ryjkov, G. Audi, P. Delheij, D. Lunney, and J. Dilling, ***New mass measurement of  ${}^6\text{Li}$  and ppb-level systematic studies of the Penning trap mass spectrometer TITAN***, Phys. Rev. C, **80**, 044318 (2009).
42. R. Ringle, M. Brodeur, T. Brunner, S. Ettenauer, M. Smith, A. Lapierre, V.L. Ryjkov, P. Delheij, G.W.F. Drake, J. Lassen, D. Lunney and J. Dilling, ***High-precision Penning trap mass measurements of  ${}^{9,10}\text{Be}$  and the one-neutron halo nuclide  ${}^{11}\text{Be}$*** , Phys. Lett. B, **675**, 170 (2009).
43. M. Smith, M. Brodeur, T. Brunner, S. Ettenauer, A Lapierre, R. Ringle, V. L. Ryjkov, F. Ames, P. Bricault, G. W. Drake, P. Delheij, D. Lunney, F. Sarazin, and J. Dilling, ***First Penning-Trap Mass Measurement of the Exotic Halo Nucleus  ${}^{11}\text{Li}$*** , Phys, Rev. Lett, **101**, 202501 (2008).
44. T. Brunner, M. Brodeur, C. Champagne, D. Frekers, R. Krucken, A. Lapierre, P. Delheij, R. Ringle, V. Ryjkov, M. Smith, I. Tanihata, J. Dilling, ***Electron Capture Branching Ratio Measurements in an Ion Trap for Double Beta Decay Experiments at TITAN***, Nucl. Instr. and Meth. in Phys. Res. B **266**, 4643 (2008).
45. V. L. Ryjkov, M. Brodeur, T. Brunner, M. Smith, R. Ringle, A. Lapierre, F. Ames, P. Bricault, M. Domsbky, P. Delheij, D. Lunney, M. R. Pearson, and J. Dilling, ***Direct Mass Measurement of the Four-Neutron Halo Nuclide  ${}^8\text{He}$*** , Phys, Rev. Lett, **101**, 012501 (2008).
46. J. Dilling, R. Baartman, P. Bricault, M. Brodeur, L. Blomeley, F. Buchinger, J. Crawford, J.R. Crespo López-Urrutia, P. Delheij, M. Froese, G.P. Gwinner, Z. Ke, J.K.P. Lee, R.B. Moore, V. Ryjkov, G. Sikler, M. Smith, J. Ullrich, J. Vaz and the TITAN collaboration, ***Mass measurements on highly charged radioactive ions, a new approach to high precision with TITAN***, Inter. J of Mass Spect., **251**, 198 (2006).
47. K. Blaum, G. Audi, D. Beck, G. Bollen, M. Brodeur, P. Delahaye, S. George, C. Guenaut, F. Herfurth, A. Herlert, A. Kellerbauer, H.-J. Kluge, D. Lunney, M. Mukherjee, D. Rodriguez, S. Schwarz, L. Schweikhard, C. Yazidjian, ***ISOLTRAP pins down masses of exotic nuclides***, J. Phys. G: Nucl. Part. Phys. **31**, S1775 (2005).
48. V. L. Ryjkov, L. Blomeley, M. Brodeur, P. Grothkopp, M. Smith, P. Bricault, F. Buchinger, J. Crawford, G. Gwinner, J. Lee, J. Vaz, G. Werth, J. Dilling and the TITAN Collaboration, ***TITAN project status report and a proposal for a new cooling method of highly charged ions***, Eur. Phys. J A - Hadr. and Nuc. **25**, 53 (2005).

#### **Published, non-peer reviewed**

49. M. Brodeur, A. Aprahamian, D. Bardayan, J. Kelly, C. Nicoloff, D. Robertson, B. Schultz, ***Rare Isotope Production for Precision Experiments at Notre Dame***, JPS Conf. Proc. **6**, 030113 (2015).
50. N. Joshi, G. Bollen, M. Brodeur, D.J. Morrissey, S. Schwarz, ***Status of the NSCL cyclotron gas stopper***, IPAC 12 conference proceedings (pre-press: 199.190.250.75/prepress/TUPPR087.PDF) (2012).
51. T. Brunner, M. Brodeur, S. Ettenauer, A.T. Gallant, R. Gernhäuser, A. Lapierre, R. Ringle, S.K.L. Sjue, P. Delheij, D. Frekers, R. Krücken, K.Zuber, J.Dilling, Design of a beta-detector for TITAN-EC and the first electron-capture branching ratio measurement in a Penning trap, J. of Phys.: Conf. Series **312**, 072006 (2011).

52. S. Ettenauer, T. Brunner, **M. Brodeur**, A. T. Gallant, A. Lapierre, R. Ringle, M. Good, C. Andreoiu, R. Delheij, D. Frekers, R. Krucken and J. Dilling, ***In-Trap Decay Spectroscopy of Radioactive Nuclei at TITAN / TRIUMF for a Determination of  $2\nu\beta\beta$  Matrix Elements***, AIP Conf. Proc. **1182**, 100 (2009).

#### **Invited talks**

1. M. Brodeur, ***Where and how were the heaviest nuclei produced?***, Astrophysics seminar, McGill University, May 2016
2. M. Brodeur, ***High precision mass measurements for Nuclear Astrophysics***, JINA-CEE biweekly MA2 online seminar, Online, February 2016
3. M. Brodeur, ***Precision beta-decay measurements to test the Standard Model***, Nuclear Physics Seminar at the Indiana University in Bloomington, USA, November 2015
4. M. Brodeur, ***Precision Experiments on Mirror Transitions***, Nuclear Physics Seminar at the University of Jyvaskyla, Finland, October 2015
5. M. Brodeur, ***Precision Experiments on Mirror Transitions***, Colloquium at TRIUMF, Canada, September 2015
6. M. Brodeur, ***Nuclides bouncing on carpets***, REU Lunch seminar at the University of Notre Dame, USA, June 2015
7. M. Brodeur, ***Weighting Nature's quirkiest nuclide***, Physics Colloquium at Valparaiso University, Valparaiso, USA, January 2015
8. M. Brodeur, ***Weighting something that you can't see and lives in the blink of an eye***, Physics Seminar at Central Michigan University, Mount Pleasant, USA, October 2014
9. M. Brodeur, ***A cyclotron facility for basic and applied nuclear science***, Notre Dame-Europe Symposium on Nuclear Science and Society, London, England, October 2014
10. M. Brodeur, ***A University-based cyclotron laboratory for nuclear science***, ARUNA meeting, Notre Dame, USA, August 2014
11. M. Brodeur, ***Trapping radioactive stuff***, REU Lunch seminar at the University of Notre Dame, USA, June 2014
12. M. Brodeur, ***RIB production for precision experiments at Notre Dame***, Nuclear Physics Seminar at the University of Jyvaskyla, Finland, March 2014
13. M. Brodeur, ***How to precisely weight one of the most exotic nuclei***, Fall DNP meeting, Newport News, USA, October 2013
14. M. Brodeur, ***Atomic Mass Measurements of Light Nuclei***, ECT\* workshop, Trento, Italy, July 2013
15. M. Brodeur, ***Mass Measurements and Surfing of the Shortest-lived Nuclei***, colloquium at University of Notre Dame, Notre Dame, USA, 2013
16. M. Brodeur, ***Ion trap experiments for nuclear astrophysics***, seminar at TUNL, Durham, USA, 2013
17. M. Brodeur, ***Mass Measurements and Surfing of the Shortest-lived Nuclei***, colloquium



at Duke University, Durham, USA, 2013

18. M. Brodeur, ***Mass Measurements and Surfing of the Shortest-lived Nuclei***, colloquium at North Carolina State University, Raleigh, USA, 2013
19. M. Brodeur, ***Mass Measurements and Surfing of the Shortest-lived Nuclei***, colloquium at Ohio University, Athens, USA, 2013
20. M. Brodeur, ***Mass Measurements and Surfing of the Shortest-lived Nuclei***, colloquium at TRIUMF, Vancouver, Canada, 2012
21. M. Brodeur, ***Mass Measurements and Surfing of the Shortest-lived Nuclei***, seminar at Argonne National Laboratory, Lemont, USA, 2012
22. M. Brodeur, ***A halo in a trap: testing nuclear theories at the extreme***, colloquium at the University of Manitoba, Winnipeg, Canada, 2012
23. M. Brodeur, ***Precision Mass Measurements of Halo Nuclei***, Nuclear Ground-State Properties of the Lightest Nuclei: Status and Perspectives workshop at Physikzentrum, Bad Honnef, Germany, 2012
24. M. Brodeur, ***Ion surfing mode for cryogenic gas catcher***, seminar at RIKEN, Wako-shi, Japan, 2011
25. M. Brodeur, ***Precision Mass Measurements of Neutron Halo Nuclei and First Radioactive HCl's using the TITAN Penning trap***, TCP 2010 international conference, Saariselkä, Finland, 2010
26. M. Brodeur, ***Precision Mass Measurements of Neutron Halo Nuclei and First Radioactive HCl's***, seminar at the CSNSM-IN2P3/CNRS (Université de Paris Sud), Orsay, France, 2010
27. M. Brodeur, ***Precision Mass Measurements of Neutron Halo Nuclei and First Radioactive HCl's***, seminar at GSI, Darmstadt, Germany, 2010
28. M. Brodeur, ***Precision Mass Measurements of Neutron Halo Nuclei and First Radioactive HCl's***, seminar at the MPIK-Heidelberg, Heidelberg, Germany, 2010
29. M. Brodeur, ***Precision Mass Measurements of Neutron Halo Nuclei and First Radioactive HCl's***, seminar at the NSCL (Michigan State University), East Lansing, USA, 2010
30. M. Brodeur, ***Mass Determination of N-Rich K and Ca***, ISAC seminar at TRIUMF, Vancouver, Canada, 2009
31. M. Brodeur, ***Mass Determination of Be-12 and others***, ISAC seminar at TRIUMF, Vancouver, Canada, 2009
32. M. Brodeur, ***The Most Exotic Nuclei on Earth: Precision Experiments on Halo Nuclei***, talk to Advisory Committee on TRIUMF (ACOT) at TRIUMF, Vancouver, Canada, 2009

#### **Contributed talks**

1. M. Brodeur, ***Experimental investigation of the repelling force from RF carpets***, International Conference on Stopping and Manipulation of Ions and related topics (SMI-2016), Institute of Modern Physics, Lanzhou, China, June 2016

2. M. Brodeur, ***High precision mass measurements for Nuclear Astrophysics***, 2016 Frontier Meeting, University of Notre Dame, Notre Dame, USA, March 2016
3. M. Brodeur, ***Precision half-life measurements at Notre Dame***, 2015 Low-Energy Community Meeting, Michigan State University, East Lansing, USA, August 2015
4. M. Brodeur, ***Precision Q-value measurement of  $^{23}\text{Mg}$  for testing the CKM matrix unitarity***, Joint DNP-JPS Hawaii meeting, Hilton Waikoloa Village, Big Island, USA, October 2014
5. M. Brodeur, ***High-precision mass measurements for nuclear structure***, Joint DNP Town meetings on Nuclear Structure and Nuclear Astrophysics at Texas A&M University, College Station, USA, August 2014
6. M. Brodeur, ***Sensitive r-process nuclei production at Notre Dame***, April APS meeting, Savannah, USA, April 2014
7. M. Brodeur, ***Traveling wave ion transport for the NSCL cyclotron gas stopper***, EMIS 2012 conference, Matsue, Japan, 2012
8. M. Brodeur, ***Ion surfing: a new mode for cryogenic gas catcher, experimental results***, APS DNP fall meeting, East Lansing, USA, 2011
9. M. Brodeur, ***The Most Exotic Nuclei on Earth: Precision Experiments on Halo Nuclei***, APS North-West Section meeting 2009, University of British Columbia, 2009
10. M. Brodeur, ***Mass Measurement of Neutron Rich Isotopes at the TITAN Experiment***, Canadian Association of Physicist 2008 conference, University of Saskatoon, Saskatoon, Canada, 2008