Kshitij Aggarwal

3rd year PhD candidate

+1 304-413-3687
ka0064@mix.wvu.edu
https://github.com/KshitijAggarwal

135 Willey Street, PO Box 6315
M59 White Hall
Morgantown, WV, 26506

EDUCATION

- West Virginia University, WV, USA — 2017 - ongoing
  PhD in Department of Physics and Astronomy — GPA : 4.0/4.0
  Advisor: Dr. Sarah Burke Spolaor
- Indian Institute of Technology, Ropar, India — 2013 - 2017
  Bachelor Degree in Electrical Engineering
  Thesis: Optimized Beamforming for the GMRT
  Supervised by: Prof. Yashwant Gupta (NCRA)

RESEARCH INTERESTS

Fast Radio Bursts
Machine Learning, Pipeline and Algorithm Development
Multi Wavelength Follow-up of FRBs

UNDERGRADUATE RESEARCH POSITIONS

- **Short Term Research Student**
  May'16 - Jun'16: Some experiments with the Giant Metrewave Radio Telescope (GMRT) Beamformer
  Dec'15 - Jan'16: A Feasibility Study for Real-Time Narrowband RFI Filtering in the GMRT Wideband Backend
  Supervisor:- Prof. Yashwant Gupta, National Centre for Radio Astrophysics, TIFR, Pune
- **Visiting Research Student**
  May'15 - Jul'15: Radio Frequency Interference Mitigation Techniques for Observational Cosmology Experiments
  Supervisor:- Prof. Ravi Subrahmanyan & Prof. Uday N Shankar, Raman Research Institute, Bangalore

SELECTED TALKS

- *Detection, Localization and Automated Classification of Fast Radio Bursts*, Astrophysics Seminar, Raman Research Institute, Bangalore, June'19
- *Spectral Index study of Millisecond Pulsars*, International Pulsar Timing Array Meeting, Pune, June'19
- *Realfast: Real-time fast transient search system at VLA*, Enabling Multi-Messenger Astrophysics in the Big Data Era, Baltimore, April'19
- *Realfast: Real-time fast transient search system at VLA*, FRB conference, Amsterdam, Feb'19
- *Machine learning techniques for FRB searches with Realfast*, Lunch Talk, AOC - NRAO, Socorro, New Mexico, Nov'18
- *Realfast: Real-time fast transient search system at VLA*, Lunch Talk, AOC - NRAO, Socorro, New Mexico, Feb'18
- *Some fun things with the GMRT Beamformer*, NCRA - Tata Institute for Fundamental Research, Pune, July'16
- *A feasibility study for real-time narrowband RFI filtering in the GMRT Wideband Backend*, GMRT, NCRA-TIFR, Khodad, Dec'15

OBSERVING PROPOSALS

- **Principal Investigator (Selected)**:
  - VLA: Follow-up of Realfast Fast Radio Bursts
    Awarded 27 hours, TOO observations

  - VLA - DDT: Localisation of RRATs using Realfast
    Awarded 6 hours
  - VLA: Localizing RRATs Using Realfast
    Awarded 13.75 hours
  - FAST: Detecting FRBs from SLSN
    Awarded 2 hours
  - Chandra Telescope: Demystifying Progenitors of FRBs
    Awarded 30ks, TOO observations
- **Co-Investigator (Selected)**:
  - VLA: Localizing a unique southern fast radio burst source
    Awarded 20 hours
  - VLA: Uncovering the radio continuum properties of Fast Radio Burst host galaxies
    Awarded 6.25 hours, TOO observations
  - GBT: Searching for Gravitationally Lensed HI emission and FRBs
    Awarded 8 hours
  - VLA: Follow-up of Realfast Fast Radio Bursts
    Awarded 9 hours, TOO observations
  - VLA - DDT: Localizing CHIME-Discovered Repeating FRBs with realfast
    Awarded 60.48 hours, TOO observations
  - VLA: Uncovering the radio continuum properties of Fast Radio Burst host galaxies
    Awarded 6.25 hours, TOO observations
  - VLBA - DDT: Milliarcsecond Localization of a CHIME-Discovered Repeating Fast Radio Burst
    Awarded 15 hours, TOO observations
  - VLA - DDT: Sub-arcsecond Localization of a CHIME-Discovered Repeating FRB
    Awarded 30 hours, TOO observations
  - VLA: Fast Radio Bursts: The First Wave of Localizations
    Awarded 13.5 hours, TOO observations
  - VLA: Uncovering the radio continuum properties of Fast Radio Burst host galaxies
    Awarded 7.5 hours, TOO observations
  - VLA - DDT: Identifying Host of FRB 180309
    Awarded 3 hours

TEACHING

- **Guest Lecture**: Antenna Fundamentals (Radio Astronomy, February 2020), West Virginia University
- **Guest Lecture**: Stellar Structures and Star Formation (Honors Astronomy, March 2019), West Virginia University
- **Workshop Assistant**: Software Carpentry Workshop (January 2018), West Virginia University
- **Graduate Teaching Assistant**: Introductory Physics (Fall 2017, Spring 2018), West Virginia University
- **Laboratory Instructor**: Introductory Physics (Fall 2017, Spring 2018), West Virginia University
- **Graduate Teaching Assistant**: Introductory Astronomy (Fall 2017), West Virginia University

GRANTS

- NRAO Student Observing Support: $3000
- XSEDE - Pittsburgh Supercomputing Center Bridges: 1200 GPU Hours

TECHNICAL PROFICIENCY

- **Languages** Python, Bash, MATLAB, CUDA C, Verilog
- **Packages** Python (Keras, Scikit-Learn, TensorFlow, PyTorch)
  MATLAB (Simulink, Antenna Toolbox, Phased Array Toolbox, Image Processing Toolbox)
- **Databases** MongoDB, Elasticsearch

PUBLICATIONS (REFEREED)

- Devansh Agarwal, **Kshitij Aggarwal**, Sarah Burke-Spolaor, Duncan R. Lorimer, and Nathaniel Garver-Daniels.

Towards deeper neural networks for Fast Radio Burst detection. *arXiv e-prints*, page arXiv:1902.06343, Feb 2019

- Yunpeng Men, **Kshitij Aggarwal**, Ye Li, Divya Palaniswamy, Sarah Burke-Spolaor, K. J. Lee, Rui Luo, Paul Demorest, Shriharsh Tendulkar, Devansh Agarwal, Olivia Young, and Bing Zhang. Non-detection of fast radio bursts from six gamma-ray burst remnants with possible magnetar engines. *MNRAS*, page 2059, Aug 2019

- D. R. Madison, D. Agarwal, **Aggarwal, K.**, O. Young, H. T. Cromartie, M. T. Lam, S. Chatterjee, J. M. Cordes, N. Garver-Daniels, D. R. Lorimer, R. S. Lynch, M. A. McLaughlin, S. M. Ransom, and R. S. Wharton. A Deep Targeted Search for Fast Radio Bursts from the Sites of Low-redshift Short Gamma-Ray Bursts. *ApJ*, 887(2):252, Dec 2019

- C. J. Law, C. M. B. Omand, K. Kashiyama, K. Murase, G. C. Bower, **Aggarwal, K.**, S. Burke-Spolaor, B. J. Butler, P. Demorest, T. J. W. Lazio, J. Linford, S. P. Tendulkar, and M. P. Rupen. A Search for Late-time Radio Emission and Fast Radio Bursts from Superluminous Supernovae. *ApJ*, 886(1):24, Nov 2019

- M. Vallisneri, S. R. Taylor, J. Simon, W. M. Folkner, R. S. Park, C. Cutler, J. A. Ellis, T. J. W. Lazio, S. J. Vigeland, **Aggarwal, K.**, Z. Arzoumanian, P. T. Baker, A. Brazier, P. R. Brook, S. Burke-Spolaor, S. Chatterjee, J. M. Cordes, N. J. Cornish, F. Crawford, H. T. Cromartie, K. Crowter, M. DeCesar, P. B. Demorest, T. Dolch, R. D. Ferdman, E. C. Ferrara, E. Fonseca, N. Garver-Daniels, P. Gentile, D. Good, J. S. Hazboun, A. M. Holgado, E. A. Huerta, K. Islo, R. Jennings, G. Jones, M. L. Jones, D. L. Kaplan, L. Z. Kelley, J. S. Key, M. T. Lam, L. Levin, D. R. Lorimer, J. Luo, R. S. Lynch, D. R. Madison, M. A. McLaughlin, S. T. McWilliams, C. M. F. Mingarelli, C. Ng, D. J. Nice, T. T. Pennucci, N. S. Pol, S. M. Ransom, P. S. Ray, X. Siemens, R. Spiewak, I. H. Stairs, D. R. Stinebring, K. Stovall, J. K. Swiggum, R. van Haasteren, C. A. Witt, and W. W. Zhu. Modeling the uncertainties of solar-system ephemerides for robust gravitational-wave searches with pulsar timing arrays. *arXiv e-prints*, page arXiv:2001.00595, Jan 2020

- **Aggarwal, K.**, Z. Arzoumanian, P. T. Baker, A. Brazier, M. R. Brinson, P. R. Brook, S. Burke-Spolaor, S. Chatterjee, J. M. Cordes, N. J. Cornish, F. Crawford, K. Crowter, H. T. Cromartie, M. DeCesar, P. B. Demorest, T. Dolch, J. A. Ellis, R. D. Ferdman, E. Ferrara, E. Fonseca, N. Garver-Daniels, P. Gentile, J. S. Hazboun, A. M. Holgado, E. A. Huerta, K. Islo, R. Jennings, G. Jones, M. L. Jones, A. R. Kaiser, D. L. Kaplan, L. Z. Kelley, J. S. Key, M. T. Lam, T. J. W. Lazio, L. Levin, D. R. Lorimer, J. Luo, R. S. Lynch, D. R. Madison, M. A. McLaughlin, S. T. McWilliams, C. M. F. Mingarelli, C. Ng, D. J. Nice, T. T. Pennucci, N. S. Pol, S. M. Ransom, P. S. Ray, X. Siemens, J. Simon, R. Spiewak, I. H. Stairs, D. R. Stinebring, K. Stovall, J. Swiggum, S. R. Taylor, J. E. Turner, M. Vallisneri, R. van Haasteren, S. J. Vigeland , C. A. Witt, W. W. Zhu, and NANOGrav Collaboration. The NANOGrav 11 yr Data Set: Limits on Gravitational Waves from Individual Supermassive Black Hole Binaries. *ApJ*, 880(2):116, Aug 2019

- **K. Aggarwal**, Z. Arzoumanian, P. T. Baker, A. Brazier, P. R. Brook, S. Burke-Spolaor, S. Chatterjee, J. M. Cordes, N. J. Cornish, F. Crawford, H. T. Cromartie, K. Crowter, M. Decesar, P. B. Demorest, T. Dolch, J. A. Ellis, R. D. Ferdman, E. C. Ferrara, E. Fonseca, N. Garver-Daniels, P. Gentile, D. Good, J. S. Hazboun, A. M. Holgado, E. A. Huerta, K. Islo, R. Jennings, G. Jones, M. L. Jones, D. L. Kaplan, L. Z. Kelley, J. S. Key, M. T. Lam, T. J. W. Lazio, L. Levin, D. R. Lorimer, J. Luo, R. S. Lynch, D. R. Madison, M. A. McLaughlin, S. T. McWilliams, C. M. F. Mingarelli, C. Ng, D. J. Nice, T. T. Pennucci, N. S. Pol, S. M. Ransom, P. S. Ray, X. Siemens, J. Simon, R. Spiewak, I. H. Stairs, D. R. Stinebring, K. Stovall, J. K. Swiggum, S. R. Taylor, M. Vallisneri, R. Van Haasterer, S. J. Vigeland, C. A. Witt, and W. W. Zhu. The NANOGrav 11-Year Data Set: Limits on Gravitational Wave Memory. *arXiv e-prints*, page arXiv:1911.08488, Nov 2019

- B. Marcote, K. Nimmo, J. W. T. Hessels, S. P. Tendulkar, C. G. Bassa, Z. Paragi, A. Keimpema, M. Bhardwaj, R. Karuppusamy, V. M. Kaspi, C. J. Law, D. Michilli, **K. Aggarwal**, B. Andersen, A. M. Archibald, K. Bandura, G. C. Bower, P. J. Boyle, C. Brar, S. Burke-Spolaor, B. J. Butler, T. Cassanelli, P. Chawla, P. Demorest, M. Dobbs, E. Fonseca, U. Giri, D. C. Good, K. Gourdji, A. Josephy, A. Yu. Kirichenko, F. Kirsten, T. L. Landecker, D. Lang, T. J. W. Lazio, D. Z. Li, H. H. Lin, J. D. Linford, K. Masui, J. Mena-Parra, A. Naidu, C. Ng, C. Patel, U. L. Pen, Z. Pleunis, M. Rafiei-Ravandi, M. Rahman, A. Renard, P. Scholz, S. R. Siegel, K. M. Smith, I. H. Stairs, K. Vanderlinde, and A. V. Zwaniga. A repeating fast radio burst source localized to a nearby spiral galaxy. *Nature*, 577(7789):190–194, Jan 2020

- Kaushal D. Buch, Shruti Bhatporia, Yashwant Gupta, Swapnil Nalawade, Aditya Chowdhury, Kishor Naik, **Kshitij Aggarwal**, and B. Ajithkumar. Towards Real-Time Impulsive RFI Mitigation for Radio Telescopes. *Journal of Astronomical Instrumentation*, 5(4):1641018, Dec 2016