

## Dossier Research Documents, by Title and Category

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In the tables below, I have provided a list of scholarly works for your consideration. I have indicated **in bold** which ones are included in this dossier. All works **included in bold** in this dossier represent work in which I was the corresponding or primary author, or for which I was a major contributor. If a *work is given in italics*, this indicates that I served as an internal collaboration reviewer for the work.

Internal collaboration reviewers perform a task similar to anonymous reviewers for journal publications, except that we are members of the collaboration publishing the article. Internal collaboration reviewers are tasked with improving the logic and polishing the text of articles. In large physics collaborations, article manuscripts are sent from the collaboration to the journal editor for anonymous peer-review after passing internal review.

These tables go beyond the works listed in the C.V., because applied and DEI research are also included. Since these items represent projects I started on my own, they are all included **in bold**, and evidence of their progress is included in the dossier. If a work is not listed **in bold** or *in italics*, it is not included in the dossier. Such listings represent articles or works where my ideas were used, or for which I made a contribution, but was not the main contributor.

| Document Title (Research Papers)  | Journal  | Category   |
|---|--|--|
| <b>Complex Analysis of Askaryan Radiation: A Fully Analytic Model in the Time-Domain</b>  | <b>Physical Review D</b>                                     | <b>The Askaryan Effect, neutrino physics and IceCube Gen2</b>            |
| <i>In situ, broadband measurement of the radio frequency attenuation length at Summit Station, Greenland</i>  | <i>Accepted for publication in the Journal of Glaciology</i> | <i>Antarctic and Greenlandic ice properties</i>                          |
| <b>Broadband RF Phased Array Design with MEEP: Comparisons to Array Theory in Two and Three Dimensions (This article won Top 10 Most Notable Articles in Electronics Journal from Dec 2020 – May 2021).</b> | <b>Electronics Journal</b>                                   | <b>Computational Electromagnetism, RF antenna design and fabrication</b> |
| <b>Broadband RF Phased Array Design for UHE neutrino detection</b>  | <b>Proceedings of 37<sup>th</sup> ICRC</b>                   | <b>Computational Electromagnetism, RF antenna design and fabrication</b> |
| Design and sensitivity of the Radio Neutrino Observatory in Greenland (RNO-G)   | Journal of Instrumentation                                   | Neutrino physics, drones   |
| Probing the Angular and Polarization Reconstruction of the ARIANNA Detector at the South Pole   | Journal of Instrumentation                                   | Neutrino physics, Antarctic ice properties                               |
| <b>NuRadioMC: simulating the radio emission of neutrinos from interaction to detector</b>   | <b>European Physical Journal C</b>                           | <b>The Askaryan effect, Antarctic ice properties</b>                     |
| White Paper: ARIANNA-200 high energy neutrino telescope.  | The arXiv: arXiv:2004.09841                                  | The Askaryan effect, Antarctic ice properties                            |
| Neutrino Vertex Reconstruction with In-Ice Radio Detectors using Surface Reflections and Implications for the Neutrino Energy Resolution  | Journal of Cosmology and Astroparticle Physics               | Antarctic ice properties, the Askaryan effect                            |
| <i>A Search for Cosmogenic Neutrinos with the ARIANNA Test-Bed using 4.5 Years of Data</i>  | <i>Journal of Cosmology and Astroparticle Physics</i>        | <i>Neutrino physics, the Askaryan effect, Antarctic ice properties</i>   |

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|---|---|--|
| <b>Observation of classically ‘forbidden’ electromagnetic wave propagation and implications for neutrino detection</b>            | <b>Journal of Cosmology and Astroparticle Physics</b>     | <b>Antarctic ice properties</b>  |
| Measurement of the real dielectric permittivity of glacial ice  | Astroparticle Physics Journal                             | Antarctic ice properties   |
| <b>Complex Analysis of Askaryan Radiation: A Fully Analytic Treatment including the LPM effect and Cascade Form Factor</b>        | <b>Astroparticle Physics Journal</b>                      | <b>The Askaryan effect</b>   |
| <i>Radio detection of air showers with the ARIANNA experiment on the Ross Ice Shelf</i>   | <i>Astroparticle Physics Journal</i>                      | <i>Cosmic ray physics, the Askaryan effect</i>                           |
| First Upper Limits on the Radar Cross Section of Cosmic-Ray Induced Extensive Air Showers   | Astroparticle Physics Journal                             | Cosmic ray physics   |
| Live-time and sensitivity of the ARIANNA Hexagonal Radio Array  | Proceedings of the 36 <sup>th</sup> ICRC                  | Neutrino physics, Antarctic ice properties, the Askaryan effect          |
| Performance of the ARIANNA Hexagonal Radio Array  | Proceedings of the 36 <sup>th</sup> ICRC                  | Neutrino Physics, Antarctic ice properties, the Askaryan effect          |
| <i>A First Search for Cosmogenic Neutrinos with the ARIANNA Hexagonal Radio Array</i>   | <i>Astroparticle Physics Journal</i>                      | <i>Neutrino Physics, Antarctic ice properties, the Askaryan effect</i>   |
| <b>Time-Domain Response of the ARIANNA Detector</b>   | <b>Astroparticle Physics Journal</b>                      | <b>Computational Electromagnetism, RF antenna design and fabrication</b> |
| <b>Radar absorption, basal reflection, thickness and polarization measurements from the Ross Ice Shelf, Antarctica</b>            | <b>Journal of Glaciology</b>                              | <b>Antarctic ice properties</b>  |
| Design and Performance of the ARIANNA HRA-3 Neutrino Detector Systems.  | IEEE Transactions on Nuclear Science                      | RF antenna design and fabrication  |
| Telescope Array Radar (TARA) observatory for Ultra-High Energy Cosmic Rays.   | Nuclear Instrumentation and Methods in Physics Research A | Computational Electromagnetism, RF antenna design and fabrication        |
| Design and Performance of the Autonomous Data Acquisition System for the ARIANNA High Energy Neutrino Detector                    | IEEE Transactions on Nuclear Science                      | Computational Electromagnetism, RF antenna design and fabrication        |
| <b>Ross Ice Shelf Thickness, Radio-Frequency Attenuation and Reflectivity: Implications for the ARIANNA UHE Neutrino Detector</b> | <b>Proceedings of the 32<sup>nd</sup> ICRC</b>            | <b>Antarctic ice properties</b>  |
| A prototype station for ARIANNA: A detector for cosmic neutrinos  | Nuclear Instrumentation and Methods in Physics Research A | Computational Electromagnetism, RF antenna design and fabrication        |
| Detection and Imaging of He2 Molecules in Superfluid Helium   | Physical Review Letters                                   | Nuclear physics, particle physics  |

| Applied Research Projects Documentation  | Project origin  | Category                                 |
|--|---|--|
| <b>Research Application: Exploration of Antarctic Ice Sheets with Drones</b>   | <b>Whittier College internal project</b>              | <b>Antarctic exploration with drones</b> |
| <b>Research Application: Workforce Development for Naval Surface Warfare Systems (NSWC), Corona Division</b>                               | <b>Office of Naval Research project</b>               | <b>Workforce development</b>             |
| <b>RF Field Engineer Course: A Practical Introduction</b>  | <b>Office of Naval Research project</b>               | <b>Workforce development</b>             |
| <b>Introduction to GPS M-Code Signals for Onboarding of Navy Personnel</b>   | <b>Office of Naval Research project</b>               | <b>Workforce development</b>             |
| Diversity, Equity, and Inclusion Documentation   | Project origin  | Category                                 |
| <b>Schedule of activities for the Artemis Program, a STEM recruitment and research opportunity for young women from local high schools</b> | <b>Whittier College internal project</b>              | <b>STEM recruitment and development</b>  |
| <b>Diversity, Equity &amp; Inclusion Innovative Initiatives Grant Proposal</b>   | <b>Whittier College internal project</b>              | <b>DEI in intro. STEM</b>                |
| <b>Changing Glaciers: So Much More than Sea Level Rise</b>   | <b>Whittier Scholars Program Undergraduate Thesis</b> | <b>Interdisciplinary research</b>        |