

Applying for NSF CAREER Awards

Spring Quarter Pre-Tenure Workshop

May 1, 2023

Prior CAREER workshop resources

<https://advance.washington.edu/services/pretenure>

W ADVANCE CENTER FOR INSTITUTIONAL CHANGE
UNIVERSITY of WASHINGTON

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Our Services

- Mentoring-for-Leadership Lunches
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Pre-Tenure Faculty Workshops

UW ADVANCE offers professional development workshops for pre-tenure faculty in ADVANCE **departments**. Offerings include an annual welcome lunch each fall and quarterly workshops on a variety of topics such as time and resource management, selecting graduate students for your lab and applying for CAREER awards.

Since 2003, UW ADVANCE has held more than 60 Pre-Tenure Faculty Workshops featuring over 100 speakers.

Resources from past Pre-Tenure Faculty Workshops

Handouts and presentation slide decks from all prior workshops.

[VIEW RESOURCES](#)

Popular resources include our Welcome Lunch and Writing an NSF CAREER Grant Workshop resources.

New Faculty Welcome Lunch

Materials to orient new faculty to UW and to faculty careers.

[VIEW WELCOME LUNCH RESOURCES](#)

Writing a CAREER Grant Workshops

Tips and advice from prior CAREER grant awardees and reviewers.

[VIEW CAREER WORKSHOP RESOURCES](#)

CAREER Awardees and Panelists

- > Jess Werk, Associate Professor, Astronomy
- > Prashanth Rajivan, Assistant Professor, Industrial & Systems Engineering
- > Laura Prugh, Associate Professor, School of Environmental and Forest Sciences

Jess Werk

Associate Professor, Astronomy

The Story of My NSF CAREER Award

TITLE OF PROPOSED PROJECT CAREER: The Disk/Halo Link: Synthesizing Gaseous Tracer Samples In the Milky Way			
REQUESTED AMOUNT	PROPOSED DURATION (1-60 MONTHS)	REQUESTED STARTING DATE	SHOW RELATED PRELIMINARY PROPOSAL NO. IF APPLICABLE
\$ 860,898	60 months	02/01/21	
THIS PROPOSAL INCLUDES ANY OF THE ITEMS LISTED BELOW			

Reduced to \$714,594

Actually, started in July 2021



Jessica Werk, Associate Professor of Astronomy, University of Washington

Example Paragraph One: A vs. B

A.

1 Overview

The Milky Way's gaseous circumgalactic medium (CGM) is a fossil record of its formation, a driver of its ongoing evolution, and a harbor for the material for future star formation. The atoms that make up our planet, the air we breathe, and our bodies all passed through the Milky Way's gaseous halo billions of years ago. While comprehensive, multidimensional maps of our Galaxy's stars, interstellar dust, gas and magnetic fields are expected from recent and upcoming all-sky surveys, its multiphase gaseous halo is still mapped to only $d \lesssim 15$ kpc, a scant $\sim 5\%$ of its likely extent. With this proposed work, I will measure the baryonic content, gas motions, and chemical composition over the full extent of the warm-ionized Galactic halo for the first time. These pioneering efforts will produce the first comprehensive characterization of both the disk and halo of our Galaxy, providing critical data needed for our theory of the Milky Way's evolution, and deeper insights into the processes that govern the evolution of other galaxies. The resulting study of the physical coupling of disk and halo gas – which likely have distinct origins and energetics – is possible *only* in the Milky Way.

B.

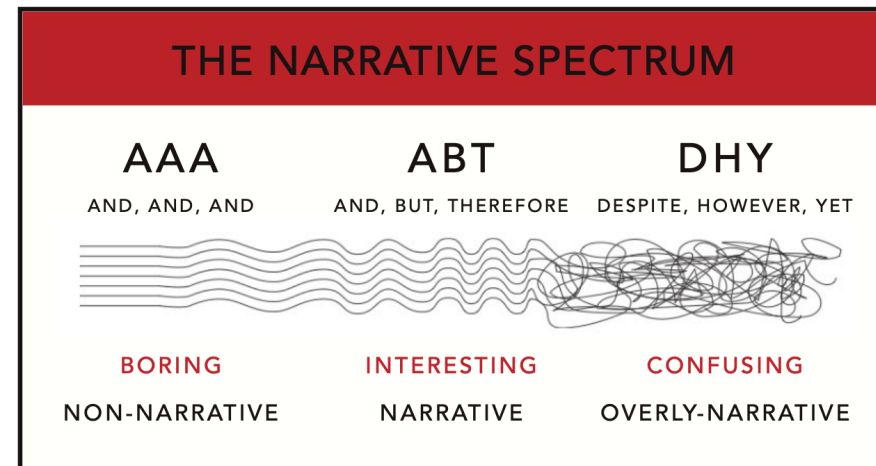
1 Overview

Gaia has ushered in an era that will be defined by scientific breakthroughs in virtually every aspect of the Milky Way's evolution. With its second public data release in 2018, we now have constraints on positions and velocities for nearly two billion of the Milky Way's stars. This information is especially powerful in combination with benchmark, ground-based surveys such as RAVE (Steinmetz+2006), GALAH (Buder+2018), APOGEE-2 (Majewski+2017), and soon, LSST (Ivezić+2019), and with data from all-sky surveys covering different wavebands: HI4PI (Bekhti+16), WHAM (Haffner+16), Planck (Planck Collaboration+18), and WISE (Wright+10). It is now possible to map three-dimensional stellar age distributions, space motions, and metallicities along with three-dimensional distributions of dust, multiphase gas, and magnetic fields. Understanding the complex physical processes happening within the Galaxy's disk – MHD turbulence in a multiphase ISM, star-formation and evolution, Galactic dynamics, and chemical evolution – is a broad goal of modern-day astrophysics that finally seems within reach.

Best Advice I Received: How You Frame your Argument on Page One is Crucial

- Central Narrative: ABT Framework
- Emphasize Need and Urgency
- Not only is there a problem, but *you* are the one to solve it

Little Miss Muffet sat on a tuffet,
(AND) eating her curds and whey
(BUT) along came a spider who sat down beside her
and (THEREFORE) frightened Miss Muffet away.



Agreement – AND – set up
Contradiction – BUT - problem
Consequence – THEREFORE - solution

Additional Advice

- Have a colleague or two outside of your subfield read your page one and give feedback
- Consider a schematic figure and a timeline graphic.

Schematic and timeline graphics organized around the five major questions my proposal addressed.

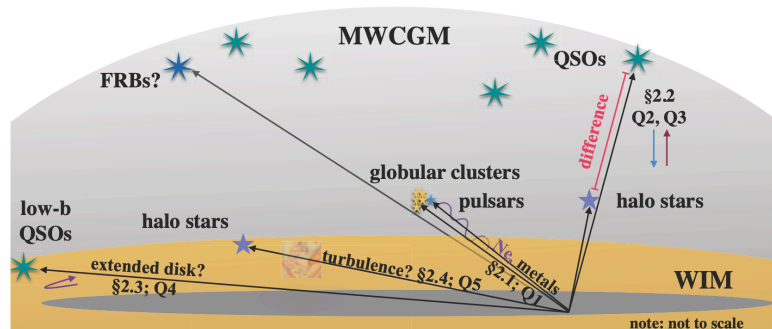


Figure 1: PROPOSAL SCHEMATIC: An illustrated summary of the experiments described in §2, addressing key science questions 1- 5. UV absorption-line spectra for both halo stars ($d \approx 10$ kpc) and QSOs ($z \gg 0$), combined with additional, multi-wavelength archival datasets, will physically link the Milky Way disk with the dynamic, multiphase MWCGM for the first time.

Science Goals	Year 1 2021 - 2022	Year 2 2022 - 2023	Year 3 2023 - 2024	Year 4 2024-2025	Year 5 2025 - 2026
§2.1; Q1 Where are the metals?	GC and PDM data analysis; spatially-resolved MW SFH	Metallicity of WIM Publication GS	Metal Retention + Metal Loss History Publication PI	Comparison with FRB/QSO pair metallicity work, ongoing meta-analyses	
§2.2; Q2 Baryon Comparison	Generate difference spectra for all new QSO/star pairs, Finalize substructure + CLOUDY models	Total Carbon Content of MWCGM Publication GS	Comparison to L* galaxies ($z = 0 - 3$) Publication PI	Integration with low-b QSO sample, difference spec at all Galactic latitudes, comparison with simulation data, ongoing meta-analyses	
§2.2; Q3 Flow Timescales		Voigt profile fitting	Inflows/Outflows Publication GS		
§2.3; Q4 Extended Disk?	APO spec confirm + APO high-res obs + HST C29 Proposal	Data analysis and model testing; public release of new low-b QSO database		Structure of MWCGM Publication PD	Meta-analyses: connection with ISM disk, simulations
§2.4; Q5 Non-thermal motions?	Line Profile Analysis, Synthetic Spectra generation and analysis on idealized sims		Non-thermal MWCGM Publication PD	Comparison to idealized sims Publication PD	Meta-analyses: sub-grid models and disk phenomena
Meta-Analyses and Data Release	Exploring connections with archival data (Planck, HI4PI, e-Rosita), github release of value-added data products (e.g. difference spectra), models and MCMC profile fitting codes		Baryon cycle from disk to halo, meta-analysis Publication	Sub-grid cosmological sim comparison Pub	

Figure 7: Year by year breakdown of effort by PI, a postdoc (PD), and a graduate student (GS), all of whom will lead the planned analyses. Planned publications are highlighted in gold, with the tentative first author listed in the lower right corner. Integrating out results with rich archival datasets and simulations will take place in the final two years of the program. All data will be publicly released in a timely manner.

Prashanth Rajivan

Assistant Professor, Industrial & Systems Engineering

My CAREER Story

- [Jan 2019] Began my journey at UW and I wasn't thinking of CAREER at that time.
 - There was a bigger responsibility to take care - birth of my daughter that summer 😊
 - After that COVID hit - a newborn inside the home and Covid-19 outside
- [Jumping to FALL 2020] - What would become my CAREER plan and WHEN?
- What – This was somewhat clear to me. I had been working on this topic since my post-doc years. I had some background work and some general directions
- When – This wasn't clear.
 - Rewind to ADVANCE NSF CAREER workshop in 2019 – suggested waiting until you had a solid idea. So stuck to that suggestion. Thank you!
- [Back to Fall 2020] - I started sketching few ideas within the topic, but I was not sold on most of them myself.
 - BTW, I was hit with rejections right and left. Quite a few dark days!
- Right about this time, some work I was doing with my PhD student had some interesting results, but more importantly produced some interesting questions.
- Following up on these questions eventually lead to developing my CAREER proposal.

My CAREER Story

- I started writing around the end of May 2021 but was building the idea in my head for several months
 - I was also building off a previously failed proposal (Not a CAREER)
- Reviewed successful applications – how to structure, language to use, how to integrate educational plan, how much emphasis to place on different sections, etc.
- Discussed comments from my failed proposal with my PM (I knew the program) – this was several months before. This was very useful.
 - Take way – Took the reviews seriously. It helped me understand where I must focus.
- Two UW resources – UW Advance and PEER group
- PEER Group: My colleague (Youngjun Choe) organized a CAREER peer group to help each other write and submit. This was game-changing for me. It kept me motivated. So, a big thanks to my colleagues!
 - First attempt with CAREER - > Successful (PM called a few days before thanksgiving to give me the good news)

Challenges and Few Parting Thoughts

- Challenge: Integrating education and research plan
 - Reasonable and achievable, yet innovative
 - Leverage existing activities and complement existing courses
 - Feedback from our department chair was helpful
- Parting thoughts:
 - Getting students passionate with your ideas could open new ideas
 - Use feedback from past submissions to scope and prioritize activities
 - Get help. Just talking about your ideas and challenges with a mentor or a colleague (and really listening) can be surprisingly helpful
 - It was always on my mind until I got it... like many things I am honored and humbled that I got it.. but I also understand CAREER cannot be the only thing that defines me.
 - Try to take care of your mental health – I am guilty of not doing that.

Laura Prugh

Associate Professor, School of Environmental and Forest Sciences

Laura Prugh, School of Environmental and Forest Sciences

DEB CAREER: Integrating positive and negative interactions in carnivore community ecology

- Received PECASE award in 2019

Message 1: Intellectual Merit is key

- Evaluation process varies. Sometimes your proposal is evaluated alongside “normal” proposals; panelists tend to weigh “normal” criteria higher than “special” criteria. Sometimes CAREER specific panels.
- What is your Big Idea and why is it novel and important?
 - *“The joint study of scavenging and intraguild predation represents a new frontier in carnivore ecology”*
- What is your plan to tackle your Big Idea?
 - Reviewers must clearly understand how your methods allow your hypotheses to be tested
- How will your project resolve an important gap in your field?

Message 2: Show how the grant will launch your (already promising) career

- Include an “about the PI” section
- Give reviewers a sense of who you are and what your integrated research/teaching program is all about: what is your vision for your career?
- Indicate how the proposed project fits naturally within your broader program
- Provide evidence of past success: key papers, preliminary results to build from, teaching innovations, existing partnerships

Message 3: Teaching is not the same as broader impacts

- “Integrated research and teaching program”
- “Teacher-scholar” (get a good letter from your department!)
- What are your educational goals? Cite pedagogical literature
- How will you assess the success of your educational objectives?
- How are you integrating the teaching and research components?
 - Explain how the teaching side improves the research side, not just vice versa (how are they synergistic)
- Ratio of ~10 pages on research plan, 5 pages on teaching plan and BI

More Resources

Some UW Broadening Participation Contacts

- > OMAD College Access programs:
 - <https://www.washington.edu/omad/pre-college-recruitment/>
- > OMAD student services programs:
 - <https://www.washington.edu/omad/services-for-uw-students/>
- > CoEnvr DEI programs:
 - <https://environment.uw.edu/about/diversity-equity-inclusion/>
- > Arts and Sciences DEI resources:
 - <https://artsci.washington.edu/about/diversity-equity-inclusion>
- > CoE DEI resources:
 - <https://www.engr.washington.edu/about/diversity>



Reminder: CAREER “Speed Dating” Abstract Review and Writing

**June 22nd 1pm—2pm in ECE 303
Call for RSVPs forthcoming**

Questions?
