WRITING GRADUATE RESEARCH PROPOSALS

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OVERVIEW

I. Understand the rhetorical situation
II. Develop a focus and an approach
III. Choose an organizational strategy
IV. Focus on reader-friendliness
V. Seek others' feedback

WHERE DO WRITERS TEND TO GO WRONG WITH RESEARCH PROPOSALS?

- Unfamiliar with genre conventions
- Too general
- Too specific
- Failure to explain why and for whom the research matters
- Lack consideration for readers

UNDERSTANDING THE RHETORICAL SITUATION

STEP 1: KNOW YOUR RHETORICAL SITUATION

Audience

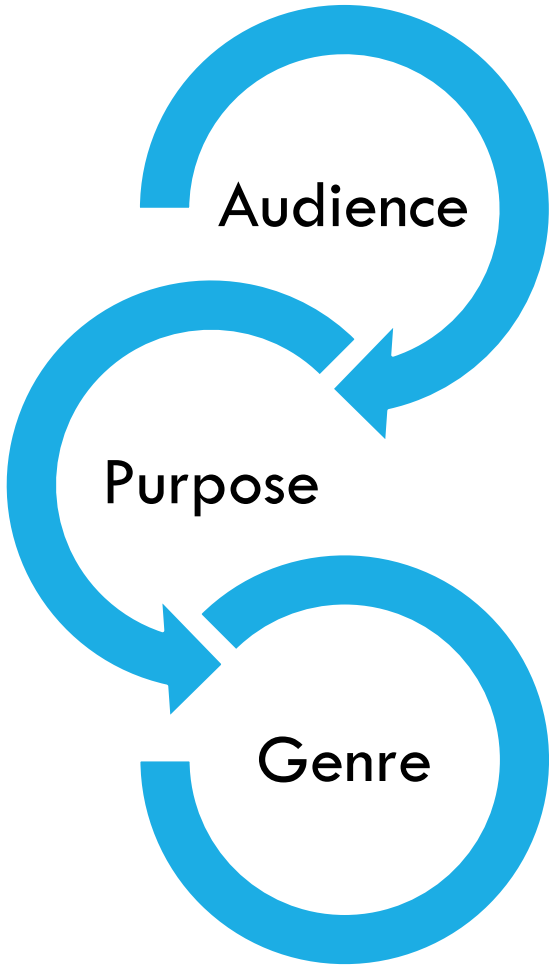
- Who is reading?
- What will those readers expect?

Purpose

- Why are you writing?
- What kind of impact do you hope to make?

Genre

- Form and conventions
- Length
- Citation styles



READ THE RFA CAREFULLY

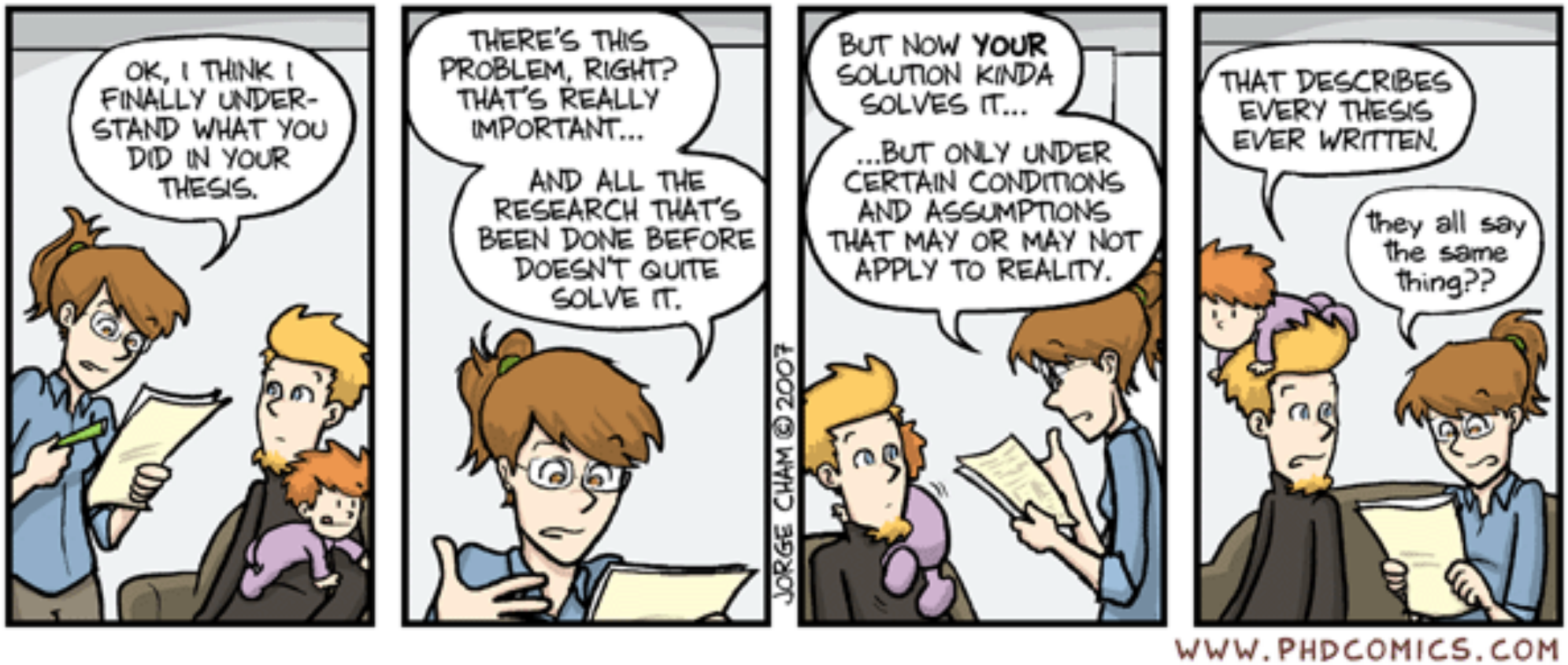
- Eligibility criteria
- Deadlines and requirements
- Review process
- Evaluation criteria

REVIEW SAMPLES

- Your advisor's recommendations
- Your department's files
- Your peers' fellowship applications

DEVELOP A FOCUS

STEP 2: DEVELOP A FOCUS



CONSIDER…

- Scope
- Timeliness
- Significance
- Impact

DEVELOP AN APPROACH

- **Approach A**
  - → **What** do I plan to do?
  - → **Why** does this need to be done?
  - → **How** will I do this?
- **Approach B**
  - → What is the **problem**?
  - → What is the **proposed solution**?
  - → What **methods** will I use?

APPROACH “A” (WHAT/WHY/HOW)

From an NSF Graduate Research Fellowship application

APPROACH "A" (WHAT/WHY/HOW)

Studying Planetary System Architecture using Radial Velocity Methods

I propose to study
velocity (RV) observation
the Transiting Exoplanet
MAROON-X[1], an inst un
student at the Univers ty
planet low-mass stella sy
result in the publicat on
statistical analysis on e th

The significance of th re
why it's important) is al o m

the specific researcn c
outlining how it will be conducted.

Consider how the rhetorical situation of an NSF grant, in particular, shapes this writer's choices…

identified and a full

Background & Research Proposal: Planet formation models predict planetary systems form in the same orbital plane. However, there are several systems[2] that suggest the inner-most planet may be inclined by a significant degree. Heavily inclined planets would go undetected during exoplanet transit surveys (observing stellar flux over time), Figure 1. The analysis of *Kepler/K2* transiting exoplanet system yield an overabundance of single

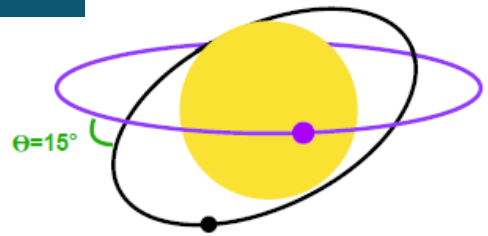


Figure 1: The inner-most planet (black) lies 15° off the plane of the system and does not transit, while an outer planet (purple) does.

APPROACH “B” (PROBLEM/SOLUTION)

From a Wisconsin Space Grant Consortium
Graduate & Professional Research Fellowship application

APPROACH "B" (PROBLEM/SOLUTION)

Problem statement

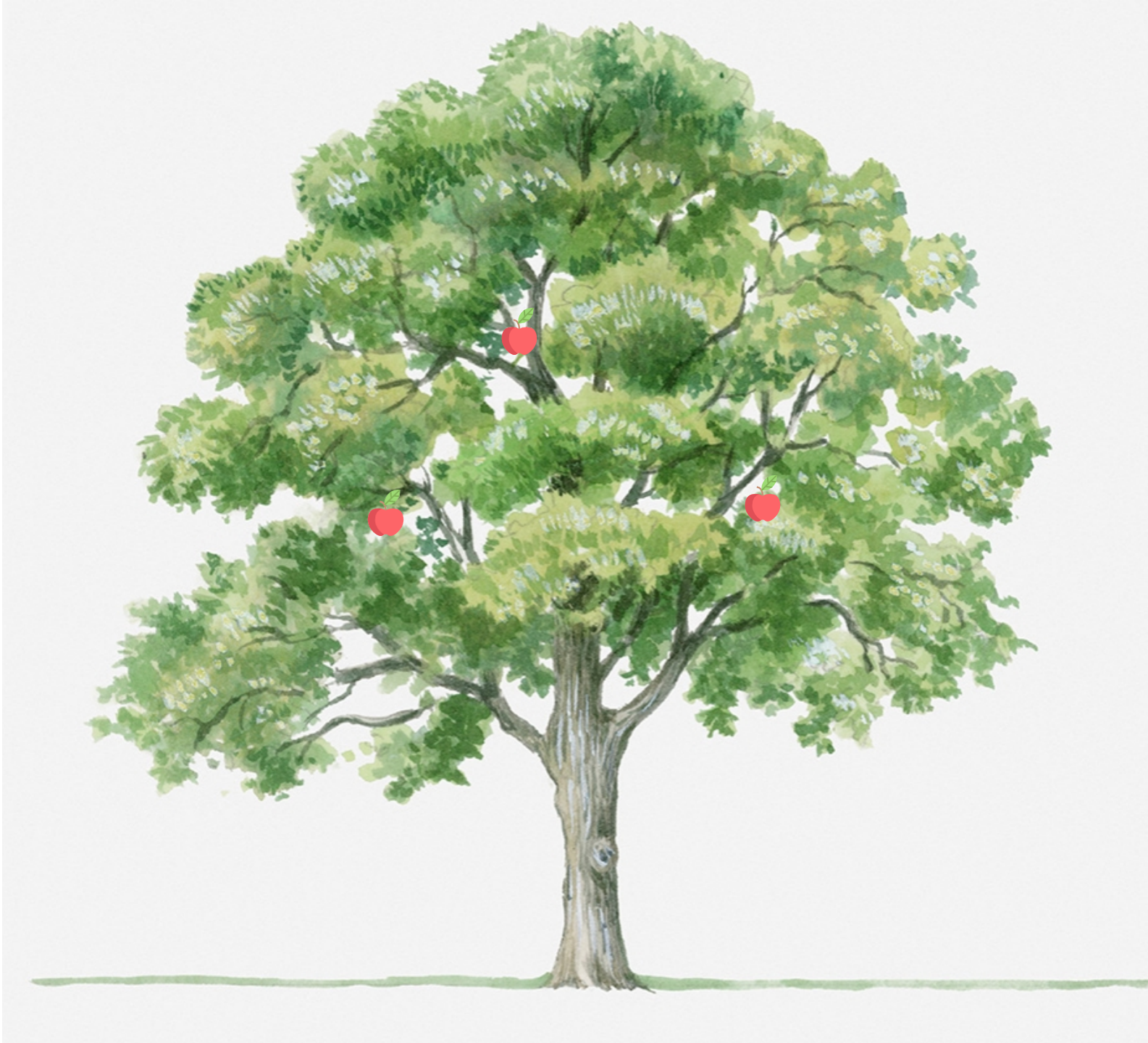
Astrophysical measur frared spectral range offer a promising route to fundame ation, star formation, galaxy evolution, and cosmology. T of molecular lines present in star-forming and galaxy-forming gases, including CO, CII, OI, H2O, and beyond. Accessing this spectral range, however, present tmospheric background severely limits the ability to perfor mitation renders balloon- and space-borne experiments nec xperimental challenges. Notably, these missions require l tral resolution and high sensitivity. We propose to study the optimization and characterization of Microwave Kinetic Inductance Detectors (MKIDs), l-suited for these stringent requirements, which could revol mos on scales ranging from solar systems to the large-scale s

"However" is a very common – and effective! – signpost for identifying the problem your research addresses.

This applicant goes on to articulate why this problem may be of particular interest or relevance to the granting agency.

Very explicit "solution" statement.

CHOOSE AN ORGANIZATIONAL STRATEGY



THREE-PART FORMAT

- Three-part format
  - → Introduction/Problem
  - → Methods/Analytical Protocol
  - → Significance/Impact

TWO-PART FORMAT

- Two-part format
  - → Introduction and Impact
  - → Methods

SPECIFIC AIMS FORMAT

- Specific aims
- Background and significance
- Research design and methods

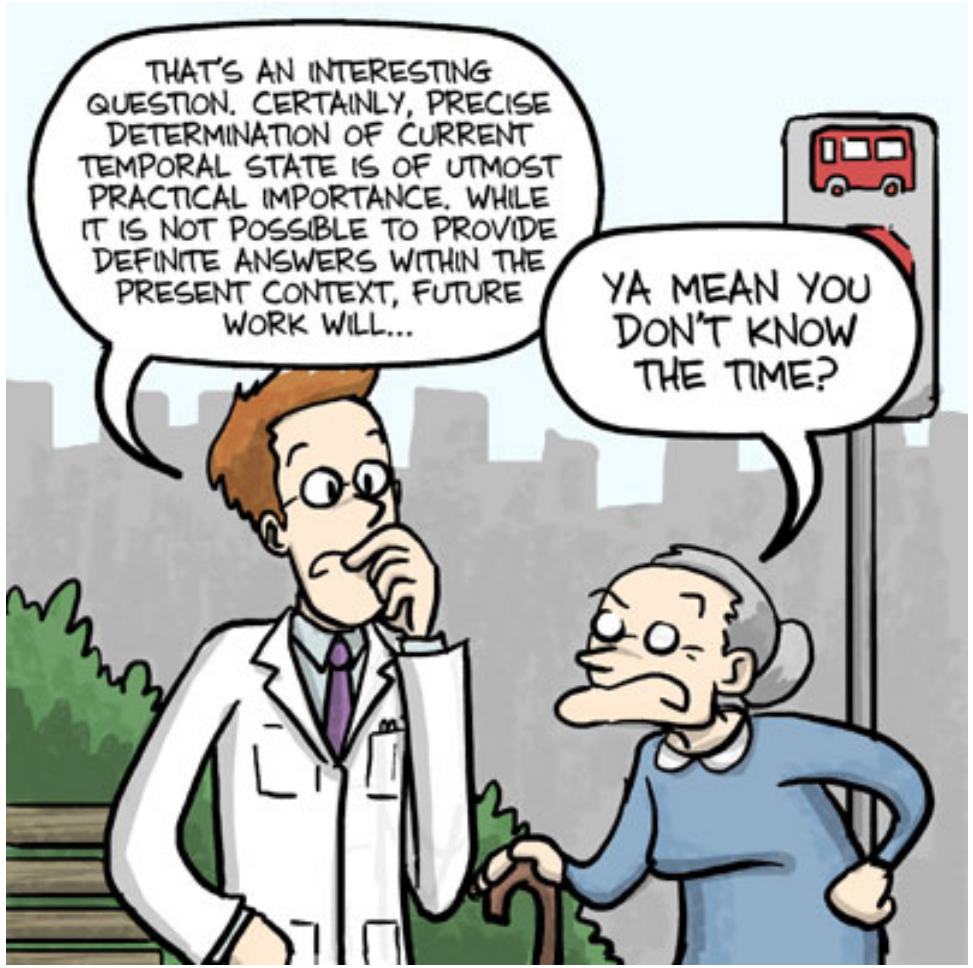
OVERVIEW FORMAT

- Introduction
- Background
- Hypotheses
- Data collection/analysis
- Contents of lengthier proposal

OBSERVE COMMON FORMAT(S) IN SAMPLE FELLOWSHIP APPLICATIONS!

FOCUS ON READER-FRIENDLINESS

HOW CAN YOU WRITE CLEARLY ABOUT COMPLEX SUBJECTS?



HELP THE READER NAVIGATE YOUR IDEAS

- Provide a clear road map from the start.
- Create clear headings and subheadings.
- Use strong lead sentences.
- Include effective transitions.
- Use verbal and visual signposts.

EXAMPLE: READER-FRIENDLINESS (NSF)

Background and Motivation: Observation of the 21cm hydrogen emission line has the potential
the evolu st exciting
400,000 yea cooling
in a period k nation came
, during whi tral
use, altho gh ad formed
yet, so the only radiation was photons from the CMB and 21cm emission coming from the
hydrogen. Thus far, researchers have been unable to
rse. Eventually, gravitational collapse allowed the first
om these galaxies then began ionizing the neutral
Epoch of Reionization (EoR). Roughly one billion years
mplete, and the universe became observable again. **My research aims at detecting the cosmological 21cm emission line, which will allow us to study the mechanisms driving the evolution of the early universe.** Improving our understanding of this period of the universe is crucial to the field of cosmology. In the most recent decadal survey by the National Academy of Sciences, experiments aimed at detecting the cosmological 21cm signal were listed as the highest priority in radio astronomy [1].

Carefully selected transition words and phrases help a reader move from one idea to the next.

Clear section headings provide a roadmap for readers by identifying the purpose of each section.

Bold text draws visual attention to key moments in the proposal. Here, it's the articulation of motivation and impact.

WRITE IN CLEAR, DIRECT SENTENCES

- Precise language
- Limited quotations
- Appropriate use of active/passive voice
- No leisurely sentence openers
- Appropriate verb tense
- Balanced use of first- and third-person pronouns

EXAMPLE: CLEAR, DIRECT SENTENCES (NSF)

Background and Motivation: Observation of the 21cm hydrogen emission line has the potential to provide tremendous insights into the evolution of the universe, and is one of the most exciting frontiers in cosmology. Roughly 400,000 years after the B
enough for neutral atoms to form in a period known as rec
a period known as the 'dark ages', during which the uni ive
hydrogen. It gets that name because, although the univers
yet, so the only radiation was photons from the CMB and
hyperfine spin-flip transition of neutral hydrog
directly observe this period of the universe. Ev
stars and galaxies to form. Radiation from thes
hydrogen in a time period known as the Epoch
after the Big Bang, reionization was complete,
research aims at detecting the cosmological 21cm emission line, which will allow us to study the mechanisms driving the evolution of the early universe. Improving our understanding of this period of the universe is crucial to the field of cosmology. In the most recent decadal survey by the National Academy of Sciences, experiments aimed at detecting the cosmological 21cm signal were listed as the highest priority in radio astronomy [1].

Notice how the core focus of the proposal is identified early in the first sentence.

First-person pronouns are not only OK but necessary in fellowship applications!

SEEK OTHERS' FEEDBACK

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- Professors, advisors
- Peers in your program
- Colleagues in your field
- Writing Center instructors

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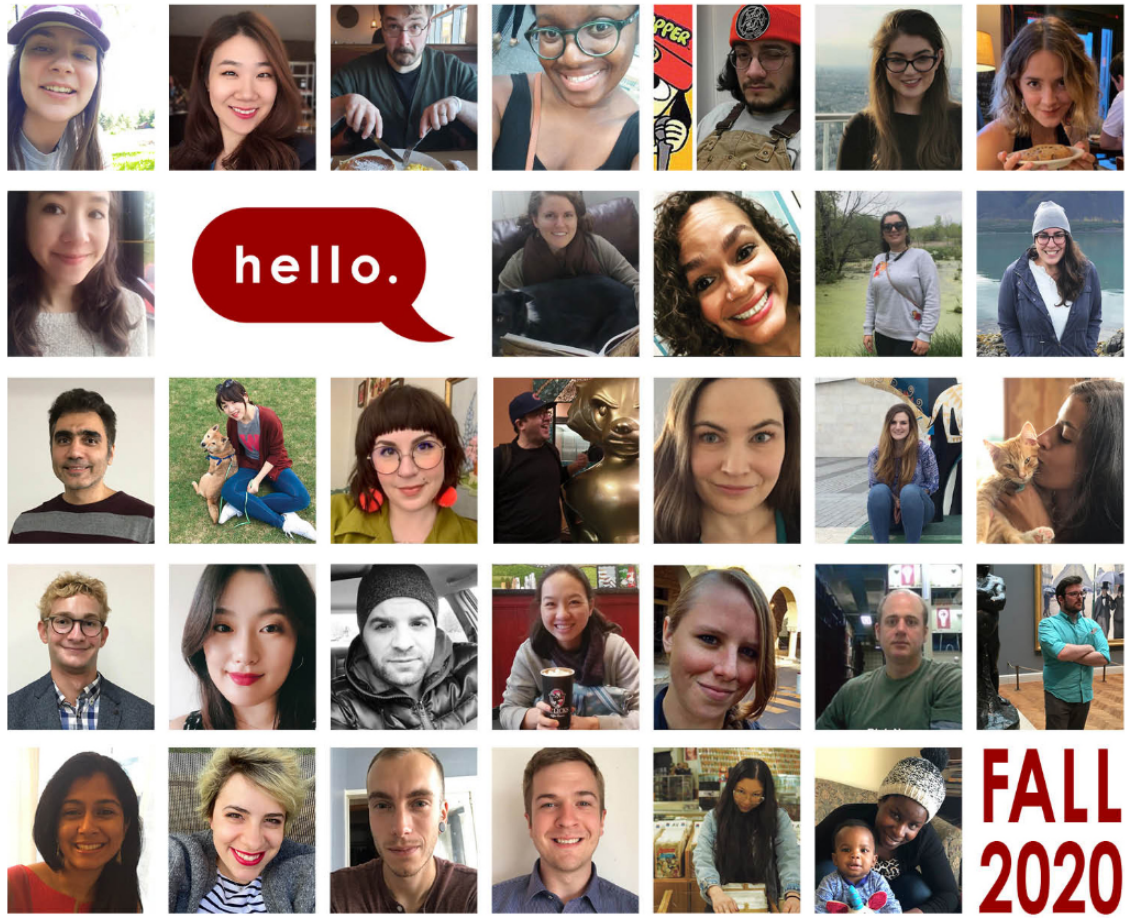

WRITING CENTER SERVICES

Writing Center website

One-to-one assistance

→ Virtual Meetings

→ Written Feedback

→ Flexible Feedback

→ Drop-In Hours

Writing Center workshops

The Writer's Handbook

THANK YOU

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