Academic Application Package

1. Cover Letter + CV (due Sept. 17 for in-class peer review)
2. Research Statement (due Sept. 24 for in-class peer review)
3. Teaching Statement (due Oct. 1 for in-class peer review)
4. Diversity Statement (due Oct 8 for in-class peer review)
5. First 5-min of Job Talk (due Oct. 15)
6. Entire package revised (due Nov. 12)
7. Webpage (due Dec. 3)

Cover Letters and CVs In-Class Peer Review

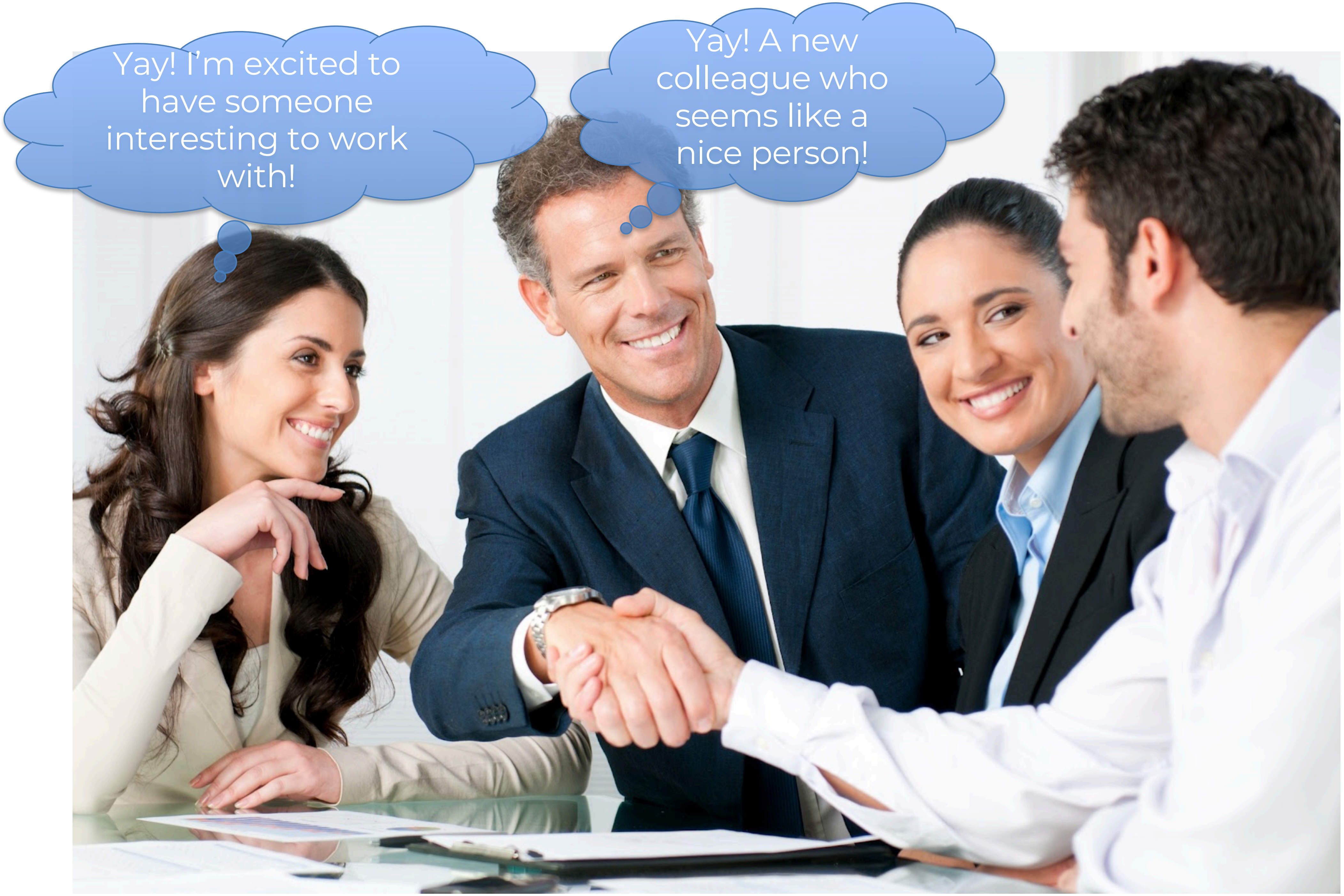
EXERCISE:
- When you get to the breakout room you will go to Files/CoverLettersCVs and find the pdf belonging to your breakout room partner
- For ~10 minutes read the materials then use ~10 min for feedback

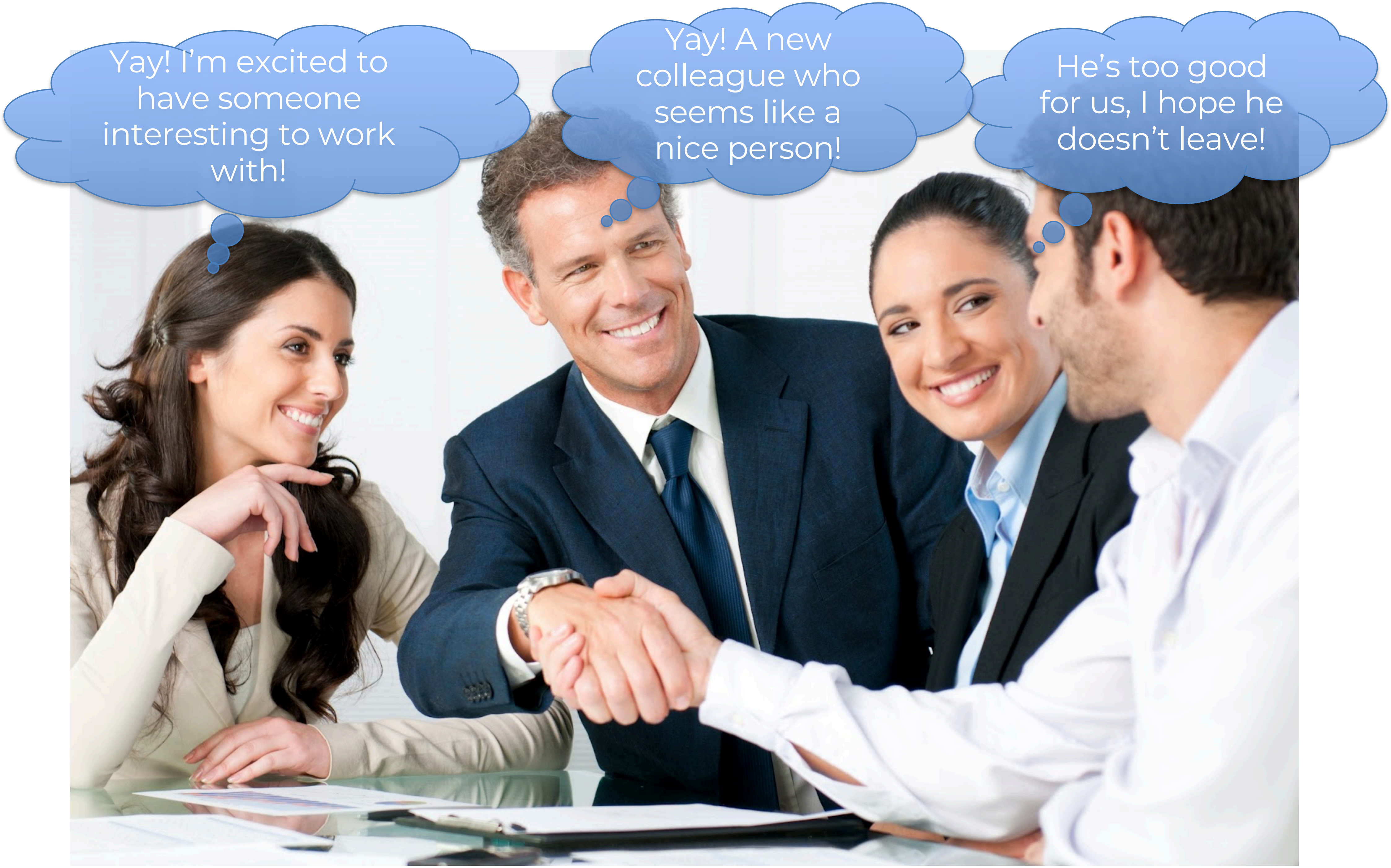
PROMPTS FOR FEEDBACK (also on Canvas):
- does the applicant fit the job ad?
- is the writing clear and compelling?
- is the significance of the work explained?
- do you get a sense of personality in the cover letter?
- is it easy to understand what the candidate has accomplished?
- is there anything missing or time unaccounted for in the CV?
- can you easily contact the candidate?
- is the material personalized towards the institution (as much as possible)?

Research Statements – why?

PURPOSE:

- presents your work in non-specialist terms and in broader context of your discipline
- shows your capacity for original ideas that contribute wisely to what has been done already
- allows you to display the enthusiasm and creativity you have as a scientist
- lays out a career roadmap for the candidate
- gives you an identity as a scientist
- shows committee that you are prepared to start a research program at the scale appropriate for that institution (i.e. realistic)
- ensures that the committee won't hire someone who is going to fail
- allows the committee to get a sense of the anticipated startup needs, where overlap exists with existing faculty, and the suitability of the research program for what the institute can provide


Yay! I'm excited to have someone interesting to work with!
Yay! A new colleague who seems like a nice person!


Yay! I'm excited to have someone interesting to work with!
Yay! A new colleague who seems like a nice person!
He's too good for us, I hope he doesn't leave!

Research Statements – how to?

Tell a COMPELLING story:

- why is your research important? Why do you do what you do?

from AAAS

Research Statements – how to?

Tell a COMPELLING story:

- why is your research important? Why do you do what you do?
- how does your work fit into the big questions being asked in your broader scientific field right now? - even if you’re not working on those questions – can you? would you?

from AAAS

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- what is the overarching theme that connects your research projects?

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- if you are not passionate about your current research, how are you taking what you know and applying it to new ideas?

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R1/R2/Research Scientist:

- how are your ideas shaping the future of the field?
- if you have proposals submitted be specific with funding agencies/solicitations and collaborators
- at R1s having submitted and/or awarded proposals will give you a bump – this takes the job of evaluating your work out of the hands of the committee since a panel/program manager has already said it's a good idea
- consider: will you be the person at the school who is an expert in X or among a group of experts in X? If the latter, how will you stand out and contribute?

from AAAS

Research Statements – how to?

Tell a COMPELLING story:

- why is your research important? Why do you do what you do?
- how does your work fit into the big questions being asked in your broader scientific field right now? - even if you're not working on those questions – can you? would you?
- what is the overarching theme that connects your research projects?
- if you are not passionate about your current research, how are you taking what you know and applying it to new ideas?

SLAC:

- how will your research involve students?
- how will your research be integrated into your curriculum?
- how does your research compliment others in the (often) small department/school

from AAAS

Research Statements

IN-CLASS EXERCISE: Brainstorming your research motivation

- why is your work important?
- why are you interested in your research?
- what is one important thing your future research will answer?
- what makes a good scientist?

from AAAS

Research Statements – how to?

Tell a REALISTIC story:

- show the committee that your years of graduate and postdoctoral study have helped you to know the difference between good ideas and good intentions
  - build ideas on solid data (your PhD work or the work of others)

Research Statements – how to?

Tell a REALISTIC story:

- show the committee that your years of graduate and postdoctoral study have helped you to know the difference between good ideas and good intentions
    - build ideas on solid data (your PhD work or the work of others)
- consider: what happens if funding in your field dries up? what will you work on?

Research Statements – how to?

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  - the best plans usually build on the prior experience of the applicant but are not direct extensions of their graduate/postdoctoral work

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  - the best plans usually build on the prior experience of the applicant but are not direct extensions of their graduate/postdoctoral work
- tailor your statement to the type of institution you are applying
  - If SLAC:
    - keep your expectations in check considering a higher teaching load
    - be sure to indicate how you would involve undergraduates in research
    - committee more likely to be non-specialists

Research Statements – how to?

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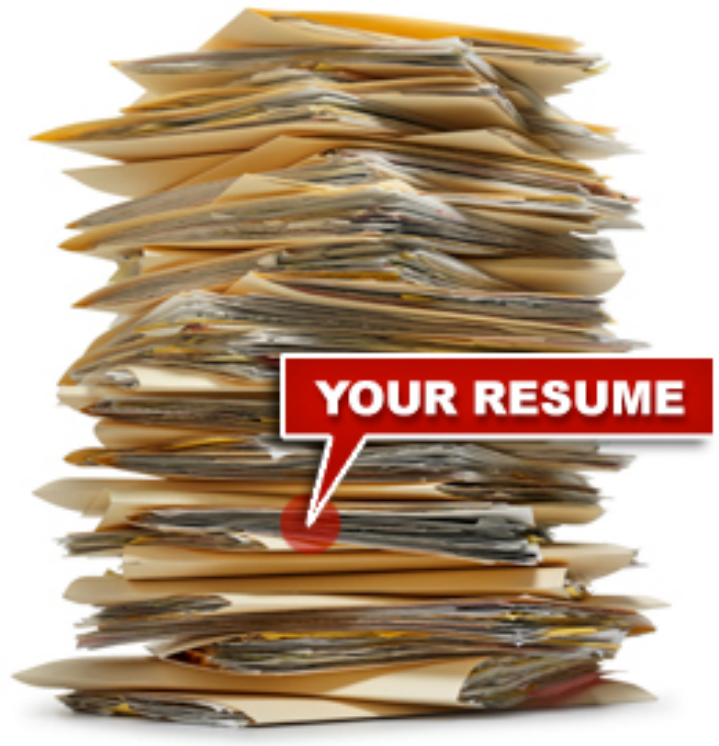
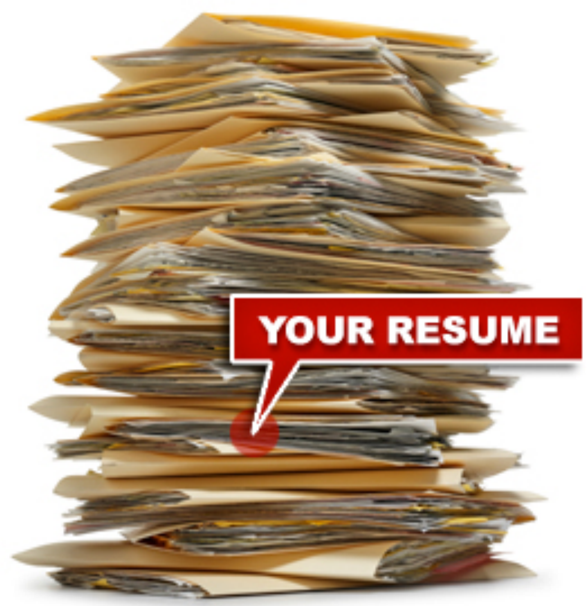
    - committee more likely to be non-specialists
  - If R1:
    - do they have people there working with similar instruments?
    - do they have people there working on similar ideas?
    - can the school afford the kinds of things you want to do? (small schools?)

Research Statements (golden rule)



Tune your statement to the department you are applying to


OMG, this is going to be so much work!


YOUR RESUME

Research Statements

SECTIONS:

1. Summary
    - your overall research goals, themes, motivation and approach.
    - can be hypothesis or question based.
2. Past and current research
    - can be two separate sections if needed
    - what is the motivation for this work and how did you contribute to this?
    - how are your results significant?
3. Future research
    - this should build on previous sections
    - perhaps short- and long-term goals in two sections
    - be realistic in terms of time and startup that the institution can provide
    - think about how students will be involved in your research

RESEARCH INTERESTS

Ginny A. Catania

Each year in the present climate, masses of water roughly equivalent to 6.5 mm of global sea level are accumulated and released from the great ice sheets of Greenland and Antarctica. These fluxes are large compared to the 1-2 mm annual rise in sea level observed during the 20th century. Thus even a modest but sustained imbalance (far short of a catastrophic collapse) could be highly consequential for sea level change over the next century. At present it is still not possible to determine even the sign of ice sheet mass balance in some places. In part, this is due to the limited representation of important physical processes in models of ice sheet change. In the case of the West Antarctic Ice Sheet, predictive models omit many of the unique dynamics recently observed in several areas (e.g., areas with fast-moving ice streams and/or disintegrating ice shelves). In some of these regions, surprisingly rapid changes in elevation and discharge may be linked to increased ocean and air temperatures. In other regions it appears that significant fluctuations in ice discharge are possible regardless of external forcing. In order to understand these differences and predict future changes we must be able to separate out the natural fluctuations that appear to be inherent in ice sheet flow from the seemingly sudden changes happening today. My main research goals are directed by these needs and are focussed on ways to improve predictions of ice sheet behaviour.

motivation

knowledge gaps I want to address

Statement when I applied to UTIG

Current Research

At present my research goal is to understand ice stream dynamics and ice-bed interactions in the Kamb Ice Stream (KIS) area. KIS is unique amongst ice streams draining West Antarctica in that its trunk region has stagnated despite the fact that fast flowing tributaries continue to supply ice into it. I am currently wrapping up a project which focused on the short-time scale (century) history of KIS prior to its shutdown with the goal of understanding the mechanisms that led to ice stream shutdown. Several satellite sources were used to target regions around KIS of suspected ice-flow change and field deployment of ice-penetrating radar in these regions permitted observation of shallow and deep internal layers used to interpret ice flow history. In some instances, these data were examined using a kinematic model of internal layer deformation which predicts the shapes of internal layers formed under a range of different boundary conditions. This allowed for the testing of several different hypotheses regarding past ice flow conditions. Several publications are in press and/or submitted for this research.

PhD research

I am also working on a collaborative project with Drs. Slawek Tulaczyk (UCSC) and Robert Jacobel (St. Olaf) to investigate the possibility that fast flow of KIS may re-start in the near future. Our approach involves both field (installation of GPS strain networks and deep radar sounding) and modelling components. The model is used to observe the life-cycle of ice streams in response to changes-in and evolution-of a sub-glacial water system under constraints imposed by our field data. Modelling for this work is already underway and GPS data analysis has begun.

postdoc research

Future Research Plans

In the next five years I will continue to actively participate in remote-sensing experiments on glaciers and ice sheets with a focus on understanding rapid ice sheet change and the basal controls on streaming ice flow. My tools of choice will be the use of a deep ice-penetrating radar system capable of imaging deep (100-3000 m) internal layers and examination of satellite imagery. I have recently been awarded funding for a collaborative proposal (with Dr. Tom Neumann at the University of Vermont) to examine the importance of surface meltwater to the peripheral thinning of Greenland. Funding for this project comes from NASA and commences with field work in Spring of 2006. Our science goal is to understand ice sheet stability in context of recently observed short-term (seasonal) ice velocity fluctuations. Our approach is to use GPS to observe velocity fluctuations and ice-penetrating radar to understand how water is transported from the surface to the bed. In addition we will examine temporal changes in the bed reflectivity through the summer melt season. We will use our results to determine the extent to which increased surface melt is responsible for the recent observations of coastal thinning of the Greenland Ice Sheet.

I have also recently submitted two collaborative proposals to NSF's Antarctic research program. The first proposal is directed at understanding ice sheet grounding zone processes and recent (millennial time-scale) changes in ice stream discharge in collaboration with Dr. Christina Hulbe at Portland State University. We plan to use numerical simulations of ice-shelf flow to determine ice flow history using two constraints; (1) analysis of high-resolution satellite imagery to observe crevasse tracks, streaklines and other features indicative of ice flow change; and (2) ice-penetrating radar measurements to determine the past locations of ice stream margins and grounding line positions. We will use these results to test several new ideas about the life-cycle of ice streams and the millennial-scale history of ice flow in the Ross Sea Sector.

A second proposal is focused at the Amundsen Sea Embayment where large, recent changes in the grounding line of Thwaites Glacier have caused inland expansion of fast-ice flow. This collaborative proposal (between Drs. Howard Conway at UW and Donald Blankenship at the University of Texas, UTIG) requests funding to examine recently acquired airborne radar data from the University of Texas during their 2004/05

new funded research and/or planned proposal submissions

My research interests extend beyond fast glacier flow as I am also attracted to similar dynamics-related problems in fluvial geomorphology, glacial geology and structural geology. In addition, I plan to seek collaborative relationships with climate and ocean scientists to improve our understanding of the complex connections between glaciers and their boundary conditions. I plan to use these sorts of collaborations, both within and outside of the University of Texas, to build upon the strong program in glaciology that currently exists there.

Description of potential collaborations (could have been more detailed but I was keeping to 2 pages)

Research Experience and Future Directions

How and why are polar and alpine landscapes changing? What sedimentary paleoclimate records will be lost when permafrost thaws and can we salvage them? How can we use knowledge of climate and surface processes on Earth to understand if Mars was ever "warm and wet"? And why do the poles matter for people who live in the temperate zone? My research aims to answer these kinds of questions by investigating the structure, origins, and future responses of polar and alpine landscapes to changing climate conditions using satellite observations, embedded sensor networks, and laboratory analyses of sediments, water, organic matter, and ice. This wide range of technical approaches is synthesized into a probe of surface composition, climate history, and future response through remote sensing and GIS analyses. "Polar geology" conjures up images of epic expeditions, grizzled scientists, and graduate students exiled to the cold and empty parts of the world. While this romantic view of polar geoscience has some historical truth to it, it is not a complete picture of how I use polar and alpine field experiments to support an undergraduate-focused research program. I believe that the combination of research and training described below would be a natural fit into Colgate's ongoing commitment to field-based research and training.

motivation

In the Geology Department, my research will continue to focus on exploring how climate information is recorded in sedimentary landforms, and on using real-time studies of changing landscape geomorphology to understand the impacts of climate change on the Earth's surface and ecosystems. I have four ongoing research areas that are ideally suited for participation by undergraduate student scientists who will help collect field data over winter and summer breaks, analyze the observations during the academic year, and in turn, learn about the interactions between climate and the Earth surface. These projects combine opportunities for both local fieldwork in the northeast U.S. and international fieldwork in Antarctica or the Arctic, hands-on sedimentological and soils analysis in the lab, and computer-based geomorphic analysis—making them ideally suited for students who have different amounts of time to commit to research, different levels of interest or comfort in the field, and different learning goals. These new research directions (next page) build on my existing research strengths in cold regions geomorphology and climate processes and harness them to produce life-changing research and learning opportunities for Colgate students.

general topics of interest for ugrad involvement

Joe Levy, SLAC Statement

Future Research Plans

Planetary-Analog Sedimentology in the Ice-Age Appalachians. Colgate's location at the interface between the glaciated northeast and the unglaciated ranges to the south makes it an ideal base from which to explore the geological record of ice-sheet and near-ice-sheet hydrogeology at the close of the last ice age. A new twist on this classic research area would be to use this key landscape interface to support planetary analog research directed at understanding how different runoff sources—snow, rain, and proglacial melt channels—are preserved in the landscape. This is a key question in Mars science today—do valley networks on Mars indicate "warm and wet" rain-dominated conditions or could they have formed from "cold and wet" snow runoff and/or ice-sheet melt? Through academic year field trips and short excursions with students, I look forward to mapping water sources and routing during Pleistocene glaciation. By combining this ground-based research with Shuttle Radar Topography Mission digital elevation models and existing LiDAR data, this project would compare drainage network geomorphic characteristics and deltaic deposit structure between watersheds dominated by ice-sheet runoff, with watersheds dominated by snowmelt runoff in the adjacent, unglaciated watersheds, and with runoff from rain in watersheds that are fully outside the Pleistocene glacial zone. This would provide key information about how runoff sources shape channel characteristics in the rock record and would provide key insights for interpreting the history of Martian valley networks.

use of local resources

Joe Levy, SLAC Statement

Research Statements

Sections:

1. Summary
   - your overall research goals, themes, motivation and approach.
   - can be hypothesis or question based.
2. Theme 1…Theme 2…
   - can be two separate sections past/present and future contributions

Through rapid and sustained ice loss, Greenland is now responsible for 25% of present day sea level rise, roughly twice that from Antarctica [*Chambers et al.*, 2017] and is primarily responsible for the recent increase in the rate of sea level rise [*Dieng et al.*, 2017]. While some of Greenland's loss is linked to increased surface melt, 40-50% of the loss is due to changes at the ice sheet marine margins [*van den Broeke et al.*, 2016], as outlet glaciers respond to climate change. Thus, our ability to predict future ice sheet mass loss with fidelity is tied to our understanding of how the ice sheet responds to climate via the ocean. Complicating the picture of overall mass loss is an observed pattern of heterogeneous dynamical behavior in outlet glaciers that remains largely unexplained. All aspects of outlet glacier dynamics exhibit spatio-temporal variability including changes in ice surface elevation [e.g. *Csatho et al.*, 2014; *Felikson et al.*, 2017], ice speed [e.g. *Joughin et al.*, 2010; *Bevan et al.*, 2012] and, terminus position [e.g. *Moon and Joughin*, 2008; *Murray et al.*, 2015].

Since outlet glacier termini are in locations where the atmosphere, ocean, ice sheet and sedimentary environments all interact there are multiple controls influencing outlet glacier stability including: 1) enhanced terminus melt induced by mixing of buoyant subglacial freshwater discharge with deep, dense, warm fjord waters [e.g. *Motyka et al.*, 2003; *Carroll et al.*, 2016]; 2) weakening of iceberg melange or sea ice [e.g. *Howat et al.*, 2010; *Moon et al.*, 2015]; 3) increased sliding due to pulsed surface meltwater reaching the glacier bed [*De Juan et al.*, 2010; *Moon et al.*, 2015], and 4) glacier geometry, which controls the state of stress at the terminus [*van der Veen*, 1996; *Bassis and Jacobs*, 2013]. Since these controls all impact glacier stability simultaneously, a clear interpretation of **how glaciers respond dynamically to climate** has been obscured. My work addresses this by quantifying glacier change over time and examining this record to deduce an improved process-based understanding of glacier dynamics.

Ice-ocean interactions

Past and present contributions:

Over the past decade, ice sheet science has evolved from a data-limited to a data-rich discipline because the changing state of the ice sheet can be largely viewed from space. My research group has taken advantage of these data, via a NASA-funded effort, to quantify the spatio-temporal patterns of outlet glacier dynamic change in Greenland over the satellite era. Specifically, we have produced the most complete record of terminus change across a region of 15 outlet glaciers in order to characterize their spatio-temporal heterogeneity and better understand the driving mechanisms for terminus retreat. These data reveal that glacier retreat in the region shares a common timing [*Catania et al.*, 2018] that is coincident with increased surface melt [*Noël et al.*, 2017] suggesting that a possible trigger for retreat could be enhanced terminus melt via subglacial discharge. On seasonal time scales, the spatio-temporal pattern of terminus change provides important clues as to the relative control of different processes acting on it. My research group has found that thin glaciers, with shallow grounding lines, have termini that are more responsive to runoff-induced changes in terminus melt [*Carroll et al.*, 2016; *Fried et al.*, 2018] and that this can lead to significant undercutting and enhanced calving [*Fried et al.*, 2015], which ultimately triggers long-term retreat.

Not all observations can be viewed from space. In particular, ocean heat delivered to the terminus occurs at depth within fjords. To understand the importance of this heat source on glacier stability I have led an effort to collect extensive in-situ ocean, glacier and atmospheric observations over two years in front of three adjacent glacier termini all experiencing different dynamic behavior. These observations represent some of the only simultaneous records of the glacier-climate system in Greenland and were used, in concert with ice-ocean modeling to understand the ocean-forced processes that lead to glacier change. We found that the bulk of the oceanographic differences between fjords results from differences in the volume and input location of subglacial runoff, which entrains dense, warm water lying at the base of the fjords and drives exchange with shelf waters [*Bartholomaus et al.*, 2016]. Further, we found that glacier thickness (i.e. grounding line depth) sets the properties (salt and heat content) of the buoyant plumes and thus their impact on terminus melt rates [*Carroll et al.*, 2016] and results in spatially heterogeneous melt rates across the glacier terminus [*Fried et al.*, 2015]. Using this new understanding my group was able to fuse multiple observational data sets together to distinguish how climate controls outlet glaciers differently; 1) thin glaciers are more sensitive to surface-melt induced runoff, which leads to sloughing of icebergs from dramatic amounts of undercutting associated with subglacial discharge outlets and; 2) thick glaciers are more likely to calve via full-thickness calving events due to floatation conditions and are thus more sensitive to melange cover in the fjord [*Fried et al.*, 2018].

New Research Directions:

There are rich data to be mined from the existing archive of satellite imagery and I anticipate future satellite missions to push resolution and volume of satellite imagery necessitating the need for automated extraction of glacier parameters (elevation, terminus position, velocity). In addition, within the broader Arctic context, there is a need for coordinated projects to connect atmosphere-ice sheet-ocean data and models as has been highlighted in several agency reports [*IARPC*, 2016; *IASC*, 2017; *National Research Council*, 2014]. NSF's new strategic plan emphasizes the need for "greater access to information, and to sophisticated tools with which to analyze it," as well as "advances in our capability to observe, model, comprehend, and predict the complexity of the world around us." To this end, my research group is actively working on using cloud-based image services (e.g. Google Earth Engine) to manipulate multispectral satellite images and improve classification of different ice terrains. By building a robust data set of classified images for polar regions that consists of image labels representing different ice terrains, we can use these labelled images to 'teach' a convolutional neural network model to segment and identify termini automatically. Thus, we can build the infrastructure to automate terminus mapping and serve these data near-real time for the marine margins of Earth's ice sheets. My graduate student was recently funded via a NASA graduate fellowship to pursue this effort.

I have also proposed to integrate a suite of remote-sensing glacier observations within a large, multi-institution cyberinfrastructure (CI) proposal (recently submitted to NSF). The scientific aim of the proposal is to develop physically and empirically-based models that express the ice sheet/ocean exchanges of heat, freshwater and sediments as a function of far-field climate variables. The work we have accomplished within my research group and across my collaborations to examine the impact of subglacial discharge on the terminus morphology via direct melting and calving [*Fried et al.*, 2015; *Carroll et al.*, 2015, 2016; *Jackson et al.*, 2017; *Fried et al.*, 2018] will be integral to this effort because these results provide important observational constraints on the impact of subglacial discharge to terminus change and thus freshwater export to the Arctic ocean. We plan to use both new and existing remote-sensing observations as validation of ocean influence on the ice sheet. In addition, the CI will support a compute-service-supported workspace for a diverse cross-section of the scientific community that connects additional observational data streams and output from current-generation climate model simulations. Our aim is that the CI will enable scientists to address urgent, societally-relevant questions that take advantage of dramatic improvements in data availability and resolution, and in computational methods that allow the integration of data, models, and physical constraints to facilitate scientific progress. As such, this project directly addresses two of NSF's 10 Big Ideas: "Navigating the New Arctic" and "Harnessing the Data Revolution".

Geometric control on ice dynamics

Past and present contributions:

While glacier retreat, speed-up, and thinning may be initiated by climate forcing, the long-term evolution of glacier dynamics is strongly modulated by geometry. This idea has been demonstrated via ice sheet models, but not been directly observed. Using a newly compiled bed map of Greenland [*Morlighem et al.*, 2017] my group has been able to provide an improved mechanistic understanding of how geometry influences ice dynamics. First, we have been able to correlate long-term terminus change to specific aspects of the glacier bed morphology. In particular, we find that once retreat is initiated, it proceeds unimpeded on reverse bed-slopes unless there is a bed bump larger than twice the seasonal amplitude of terminus advance/retreat [*Catania et al.*, 2018]. This provides a specific measure of bed morphology that can be used as a predictive tool for understanding the magnitude of future retreat, and for acquiring new bed geometry data at an appropriate resolution. Second, glacier terminus changes impact interior ice through thinning, which propagates from the terminus as a kinematic wave [*Nye*, 1960]. By quantifying the spatial pattern of ice sheet thinning my group was able to demonstrate that advection rates of the kinematic wave must be three times larger than diffusion rates in order to prevent thinning from migrating inland [*Felikson et al.*, 2017]. Because the rates of advection and diffusion are determined to a large degree, by the local geometry of the glacier, our results permit an explanation for the disparate spatial pattern of glacier elevation change across Greenland. In addition, our empirical threshold allows us to predict the upglacier extent of thinning even for glaciers that have not yet begun to retreat. We have thus used this metric to rank every glacier in Greenland by the ability for its geometry to translate a thinning wave into the interior ice.

During the process of working on the role of glacier geometry on inland thinning, we discovered that the majority of glacier thinning limits (70%) are associated with glacier bed knickpoints - steep reaches of bed topography that represent a step change in topography separating smooth, submarine glacial troughs from inland regions that extend to the ice divide. By examining the character of these knickpoints around the ice sheet we were able to identify those glaciers without knickpoints as ones that permit thinning to extend far to the interior. In general, glaciers without knickpoints lie in regions of Greenland that contain more gentle topography and this then suggests that the regional topography, which evolves over multiple glacial cycles, can pre-condition future ice sheet mass loss.

New Research Directions:

My group has shown that mountain building, glacier dynamics, and erosion all combine around the ice sheet margins to produce persistent landscape features that exert a stabilizing influence on the modern-day setting of the ice sheet. Questions remain however, about the rates of erosion and uplift and how these might impact long-term ice sheet stability. To address this, I am working with a new collaborator (on an NSF proposal) who has built a model that couples glacier and sediment dynamics [*Brinkerhoff et al.*, 2017]. Together, we would like to explore the long-term evolution of the Greenland ice sheet to understand the formation of glacier bed knickpoints and how their morphology changes with time via erosion and uplift. We plan to use our current work as a roadmap for this new project - exploring the idea that regionally-steep terrain produces steeper knickpoints closer to glacier termini and to understand why all knickpoints are fixed at sea level elevations, as observed.

My group also plans to expand on the role of glacier geometry on ice dynamics through ice sheet modeling using ISSM, a large-scale thermo-mechanical 2D/3D finite element model capable of modeling ice flow at high-resolution and at a continental scale. This software is open-source and freely available. We plan to use ISSM in two ways, first, to force an outlet glacier (with known subglacial topography) with terminus changes that match our remote sensing observations to compare a numerical solution for propagation of inland thinning to our empirical solution from kinematic wave theory. This work is already underway with my PhD student Denis Felikson. Second, I plan to use ISSM to test various parameterizations of outlet glacier calving laws to obtain a match to our observations of terminus change. My goal is to be able to understand the physical processes that lead to the observed pattern of retreat and thinning and then to use this understanding to link ice sheet and climate models for improved future sea-level projections. Once I get some preliminary results for this, I plan to submit a proposal to NSF for funding continued work on this topic. My ultimate goal is to be able to reproduce the observations of terminus change generated from our automated terminus picking algorithm.

In addition, if bed bumps can mitigate against retreat and knickpoints can mitigate against inland thinning, a deeper understanding of the processes that redistribute sediment is needed. Motivated by this need, I have been involved in a large multidisciplinary effort to examine the submarine environment in front of a grounded glacier to quantify in situ sediment deposition and erosion rates with a remotely-operated submersible vehicle (NSF proposal pending). Our goal is to produce an observationally-constrained understanding of the different sedimentary processes occurring and their relative contribution to moraine building. This project is intimately coupled to an ice sheet erosional model [*Brinkerhoff et al.*, 2017] that will be refined with the observational work to produce a more accurate depiction of the subglacial processes at work to control ice dynamics. This proposed effort will provide novel insight into ice sheet physics and glacier interactions with sediment and ocean water to address a need identified in the US CLIVAR workshop on ice-ocean interactions to "identify modern sedimentation rates" in order to "inform process-based studies examining the links between sedimentation and glacier stability" [*Heimbach et al.*, 2014].

References

Bartholomaus, T. C., et al., Contrasts in the response of adjacent fjords and glaciers to ice-sheet surface melt in West Greenland, *Annals of Glaciology*, pp. 1–14, doi:10.1017/aog.2016.19, 2016.

Bassis, J. N., and S. Jacobs, Diverse calving patterns linked to glacier geometry, *Nature Geoscience*, *6*(10), 833–836, doi:10.1038/ngeo1887, 2013.

For Next Week…

Exercise: Create a ~2pg Research Statement for next Thursday

- Think about how and why you got started with your research
- What motivated you to spend so much time on answering the questions you developed?
- How does your past/current research connect to where you want it to go?
- Focus on the scientific results, not your experience or expertise
- Do not overhype your work
- Cite the existing literature well and accurately* – nobody works in a vacuum