New Faculty Orientation: Research

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Interim Vice Dean for Research

Mahta Moghaddam
Director of New Research Initiatives

Nichole Phillips
Director of Research Administration
About the Presenter

- Joined USC in 2018 as a Professor. Interim Vice Dean for Research (2020).
- Research Restart Committee.
- Research: computation and data-driven discovery (CD3) group.
- Funding: NSF, NIH, DoD, DoE, NASA, foundations, industry gifts.....

- Academia is a great place to continually invent yourself, but do so wisely
Goal & Methods

https://viterbischool.usc.edu/researchandinnovation/

- **Goal:** Facilitating and Enhancing Research Excellence
- **Methods:**
  - Programs for junior faculty
  - Active dissemination of opportunities (gist & web)
  - Leveraging Office for Research opportunities
  - Collaborating with other USC schools & units
  - Help with center and other large-scale proposals
  - VICI fund for incubating centers
  - Visioning exercises and strategic initiatives
  - Awards Office
  - Viterbi Research Committee
Junior Faculty Programs

- At least one mentor for pre-tenure faculty
  - mentoring lunches, meetings
- Funding for travel to meet with sponsors
  - if not already in startup package
- Internal review program for NSF Career proposals
- “Best practice” advice for early career/young investigator program
- Viterbi support for YIP proposals, especially broader impact
  - E.g., reduced indirect costs for DoD, DoE and NASA.
- Directed dissemination of YIP funding opportunities
- Personalized advice from the DC Research Office
University & Viterbi Research

- USC is a Research I university
- USC has consistently risen in national research volume rankings:
  - In total research expenditures (~$890M): around 11th among private and around 23rd among all (ahead of UC Berkeley, Northwestern)
  - In federal expenditures (>500M): 10th among private and 19th among all (ahead of MIT)
  - Viterbi is the 2nd largest contributor (after Keck/Medicine)
- Viterbi’s research expenditures are about 210M per year (3rd among private, after MIT and Stanford, 8th overall); this includes all engineering-affiliated centers and faculty and all types of research funding (federal, corporate, and private)
- The funding portfolio is distributed over various sources
Interdisciplinary Research

• USC spotlights **societally relevant research**; such research is inherently interdisciplinary (read USC vision doc)

• Interdisciplinarity is a major strength of USC

• Take advantage of our varied strengths in the numerous schools: Keck, Annenberg, Dornsife, Dentistry/Kinesiology, Gero, Cinematic Arts...

• BUT: pre-tenure interdisciplinary research has risks:
  • Must show a major contribution in at least one field, cannot straddle and be OK “overall” or “on average”
  • Promotion letters needed from recognized major figures in the field
  • If you are defining a new area, make sure it is recognized and considered a contribution; give talks far and wide, and publish in **recognized established journals with good impact factors**
USC Office of Research

https://research.usc.edu

• Under Interim Vice President Maja Mataric (of Viterbi)
  – reports to the Provost
• **Purpose**: help faculty in the process of research:
  • University-level strategy, initiatives, partnerships
  • Training courses via the Center for Excellence in Research (CER)
  • Support for shared equipment cores
  • Cost-share on center proposals
  • Internal funding programs
  • Funding information dissemination
  • Management of institutionally limited funding opportunities
  • Oversight of USC Stevens Institute of Innovation
  • Washington DC branch
Washington DC Branch of USC Office of Research

https://research.usc.edu/dc/

- Steve Moldin, Executive Director, most experience with NIH
- Jim Murday, DoD expertise, especially nano & energy
- Al Olson, intelligence community & other services
- Internal NSF experience from several NSF staff and rotators
- Multiple consultants in DC
- Facilitate large grants, meetings with DC funders, workshops in DC and locally, visits by funders...

- First contact: Interim Vice Dean Assad Oberai (aoberai@usc.edu)
  - Connection to the Vice President
  - Connection to the DC Office and Steve Moldin
Center for Excellence in Research (CER)

https://research.usc.edu/training/

- A Senate-Provost initiative that originated in the University Research Committee by M. Matarić
- The USC Office of Research supports and houses the program and offers a menu of information and training workshops about obtaining funding from various federal agencies, industry, foundations, etc.
Internal Funding Opportunities: University Level

https://research.usc.edu/funding/uscd

- Zumberge: individual ($30K, year-round), multi-school interdisciplinary ($85K, annual), diversity and inclusion (30k), and epidemic-related.
- Collaborative Research Fund ($30K/year, up to 3 yrs)
- Core Instrumentation Fund: Two types. As-needed cost-share (like DURIP).
- Initiatives:
  - SC Clinical and Translational Science Institute (varying amounts and foci)
  - Ming Hsieh Institute for Research of Engineering-Medicine for Cancer and other Diseases ($150k per year).
  - Many others, see web page
Contracts & Grants Administration

**Central:** Dept. of Contracts and Grants (DCG), run by Jeri Muniz, under the VP for Research Maja Mataric; submits ALL proposals
  - Compliance with federal and other funding submission regulations
  - Amanda Reguengo is the Principal Officer for Viterbi in DCG

**School-level:** Viterbi Business Affairs Office (VBA), approves proposals before proceeding to DCG & submission; oversees school-level compliance for pre- and post-award. Viterbi contact to DCG: Nichole Phillips, Director of Viterbi Research Administration

**Local/department-level:** Your dept. business manager will assign a research administrator, who prepares proposals and submits to VBA
  - These are services **BUT please:**
    - Be mindful of people involved and timing expectations
    - Read the memos/emails
    - Report problems to Nichole Phillips
Viterbi Proposal Timeline

- Notify your Research Administration (VBA-RA) about your intent to submit and provide a link or attachment of announcement
- 7-9 Business Days Prior to Submission the Proposal Packet should reach VBA office
  - In General this consists of:
    - RFP/Guidelines
    - Cover Sheet for Signature (if electronic then just print the cover sheet for ex. NSF) unless S2S then not needed.
    - Budget
    - Budget Justification
    - Draft of Scope of Work/Technical Justification
- 3 Business Days Prior to Submission submit all Final documents to the DCG
Overhead

- Overhead = indirect cost, facilities and administration
- Pays for operating expenses of the university & school
- Overhead rate is 65%, determined by USC not Viterbi
- On par with comparable universities
- Of that 65%, ~12 pts (19%) goes to the Central USC Facilities Fund; there is also an overall participation tax (6%)
- Research is not really a revenue source
- Things that do not incur overhead:
  - Equipment (> $5,000)
  - Tuition
  - Participant support costs
  - Subawards/contracts (only the first $25k of subs are subject to overhead)
  - Agency-mandated no overhead programs (see cost-share)
Cost-Share

• Cost-Share = Viterbi’s subsidy for a specific effort/proposal; a cost to the school
• Indirect costs can be cost-shared under appropriate conditions; this is an income loss for the school
• Some federal grant programs and some foundations require it

• All cost-share requests must be submitted through the Viterbi online cost-share system at least 14 business days prior to the proposal submission deadline (at least a month for centers and/or other collaborative proposals with multiple schools involved)
• https://viterbibusinessaffairs.usc.edu/research-administration/cost-sharing
Viterbi Dissemination of Opportunities

- Weekly Research Gist
  - Funding opportunities
  - Local meetings/workshops
  - Research-relevant university announcements
  - Email from the vice dean for research
- Comprehensive research portal:
  [https://viterbischool.usc.edu/researchandinnovation/](https://viterbischool.usc.edu/researchandinnovation/)
- Awards
- COVID-19 FAQ for USC Viterbi Researchers
- Faculty Research Topics
- Faculty Research Resources
- Funding Sources for Undergraduate Research
- NAE Grand Challenges
- Research Addressing COVID-19 Challenges
- Research Centers
- Research Infrastructure
- Research Initiatives
- Research Vision
- Student Resources for Undergraduate Research
Early Career & Young Investigator Awards

- Many agencies have early career awards: NSF, NIH, ONR, Army, Air Force, CDMRP, DoE, etc.
- Your odds of getting these are higher than for other types of grants
- These are often considered prestigious (e.g., NSF CAREER, ONR Early Career) and lead toward higher-level honors & awards (NSF and other PECASE awards)
- These pave the way for future awards from the same agency
- These help you get tenure (some type of YIP award is basically expected for promotion in Viterbi)
NSF CAREER Awards

- Almost all of our assistant professors get these
- You can apply up to 3 times
- Plan strategically and be ready:
  - Contact the relevant agency program director to learn more and discuss your plans
  - Take the Provost’s training course in May
  - Participate in the internal review program
  - Take broader impact very seriously (for all NSF grants, not just CAREER); it may decide if you get funded among the top candidates

- This advice applies to all other early career proposals as well
Broader Impacts

- NSF and some other agencies focus on broader impact & outreach
- A web page or a standard course not sufficient; instead, consider:
  - A well thought-out outreach program
  - K-12 teacher training & local school visits
  - Partnership with a public institution (e.g., California Science Center)
  - Many more good models, be creative
  - Example: NSF RET Program (supplements and sites) and GK-12 Program (BE-LA)
- Societally relevant research is a key tenet of the USC Vision
- Dr. Katie Mills from the Viterbi K-12 STEM Center help each faculty member individually design a broader impacts program for Career and other proposals
Viterbi Internal Center Incubator (VICI)

- VICIs created to bolster the transformative vision of the School
  - Goal: enable multiple clusters of faculty to collaborate along high-impact technology and societal directions

- Ten centers selected by the Viterbi Research Committee in 2015-2018 via a competitive proposal process
  - Seed funds of up to $80k per center

- Several other centers created separately during same time period
  - Seed fund amounts vary

[https://viterbischool.usc.edu/faculty/faculty-research-resources/research-initiatives/viterbi-internal-center-incubator/](https://viterbischool.usc.edu/faculty/faculty-research-resources/research-initiatives/viterbi-internal-center-incubator/)
<table>
<thead>
<tr>
<th>Center Name</th>
<th>Focus Area</th>
<th>Director</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AWARE: Center for Arid Climate Water Research</strong></td>
<td>Water, sustainability, climate</td>
<td>Mahta Moghaddam</td>
</tr>
<tr>
<td><strong>Biomimicry for Synthesis of Smart Textiles</strong></td>
<td>Materials engineering</td>
<td>Malancha Gupta</td>
</tr>
<tr>
<td><strong>CENTIENTS: Center for Intelligent Environments</strong></td>
<td>Built environment</td>
<td>Burcin Becerik-Gerber</td>
</tr>
<tr>
<td><strong>CMPI: Center for Machine and Process Intelligence</strong></td>
<td>Data analytics</td>
<td>Joe Qin</td>
</tr>
<tr>
<td><strong>CIEBOrg: Center for Integrated Electronics and Biological Organisms</strong></td>
<td>Materials and neuroscience</td>
<td>Megan McCain, Rehan Kapadia</td>
</tr>
<tr>
<td><strong>CPPE: Center for Peptide and Protein Engineering</strong></td>
<td>Materials, proteins, peptides</td>
<td>Rich Roberts</td>
</tr>
<tr>
<td><strong>HealME: Healthcare and Medical Engineering</strong></td>
<td>Healthcare</td>
<td>Ellis Meng</td>
</tr>
<tr>
<td><strong>RASC: Robotics and Autonomous Systems Center</strong></td>
<td>Robotics, AI</td>
<td>Maja Mataric, Gaurav Sukhatme</td>
</tr>
<tr>
<td><strong>SleepHUB: Center for Sleep Health Using Bioengineering</strong></td>
<td>Sleep disorders</td>
<td>Michael Khoo</td>
</tr>
<tr>
<td><strong>Vertex</strong></td>
<td>Networks and Control</td>
<td>Urbashi Mitra</td>
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# Directed VICIs

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<tr>
<td><strong>CAIS</strong>: Center for Artificial Intelligence in Society</td>
<td>AI</td>
<td>Bistra Dilkina (co-director)</td>
</tr>
<tr>
<td><strong>CAM</strong>: Center for Advanced Manufacturing</td>
<td>Manufacturing</td>
<td>SK Gupta</td>
</tr>
<tr>
<td><strong>CCI</strong>: Center for Cyberphysical Systems and the Internet of Things</td>
<td>IOT</td>
<td>Bhaskar Krishnamachari</td>
</tr>
<tr>
<td><strong>MASCLE</strong>: Center for Machine Learning</td>
<td>Machine learning</td>
<td>Yan Liu</td>
</tr>
<tr>
<td><strong>CSC@USC</strong>: Center for Systems and Control</td>
<td>Control systems</td>
<td>Mihailo Jovanovic</td>
</tr>
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Other Research Centers

https://viterbischool.usc.edu/research-centers/

- Research centers of excellence are a means of facilitating high-impact usually interdisciplinary research
- Viterbi has many centers
- Participate, enhance your research, collaborate, leverage

- BUT: keep your research contribution clear and identifiable
- AND: don’t get involved in a major service role in centers before tenure (e.g., Education Director, Outreach Director, etc.)
New Research Initiatives Program

• Overseen by Mahta Moghaddam, collaboratively with Research Vice Dean
• Ideation, team-building, and implementation of new research initiatives
• Coordination between faculty research (including Viterbi research centers), industry partners, and Advancement activities
• Coordination of convergent research initiatives between USC Viterbi and other entities both on-campus and off-campus
• Targets of specific active pursuit:
  • NSF ERC, STC, and MRSEC proposals
  • MURI
  • NIH centers
  • DoE EFRC, DoD centers, EPA SCPC
  • Corporate and Foundation relationships for basic and applied research
Facilitating Center-Scale Proposals

- We want to encourage Viterbi leadership on large, center-level proposals
  - Proposal management support, teaching release, discretionary resources, etc.
  - Submit requests to Mahta Moghaddam
- Use proposal coordination process led by Nichole Phillips
  - Graphics support ([https://viterbischool.usc.edu/graphic-design-and-web-resources-for-usc-viterbi-faculty-and-staff/](https://viterbischool.usc.edu/graphic-design-and-web-resources-for-usc-viterbi-faculty-and-staff/))
  - Grant writer/editor support
- Initiate space request negotiation (Linda Rock)
- Streamlined cost-share procedures (on-line form)
- Interaction with the VP for Research via Vice Dean for Research to get support for interdisciplinary=multi-school proposals
- Need to reach out early in order to provide support and contract with outside vendors such as graphic artist and/or writer/editor
Viterbi Awards Office

- Role: to serve as a resource to Viterbi faculty and department chairs in nominating our Viterbi faculty for national and international awards, fellow and advisory committee opportunities
- Structure: two staff members (Kim & Kelly)
- Activity stats: ~ 90 nominations/year, ~30% success rate

Point of contact:
- Kim Matsunaga (kim.matsunaga@usc.edu)
- If you feel ready to be nominated for an award, make sure to contact Kim or your department chair
Awards Notification Tool

• Purpose: notification, tracking, and recognition of faculty awards
• **Faculty** enter their own awards on myViterbi site. Dept. chairs screen and distribute.
• Types of awards to be reported: best paper awards, society awards, fellowship distinctions, and national and international awards.
• No grants and contracts, with the exception of Early Career Awards/Young Investigator Awards/Pioneer Awards which are also distinctions.
Viterbi Core Infrastructure

https://viterbischool.usc.edu/shared-research-infrastructure/

- Shared core infrastructure with user fees:
  - Core Center of Excellence in NanoImaging (CNI, Andrea Hodge)
  - John O’Brien NanoFab Core & Cleanroom (Andrea Armani)
  - Center for Peptide and Protein Engineering (CPPE, Rich Roberts)
  - Viterbi-Dornsife Machine Shop
  - Center for Advanced Manufacturing (CAM, SK Gupta)
  - Structures and Materials Research Laboratory (SMRL, Bora Gencturk)
  - USC-Lockheed Martin Quantum Computing Center (Daniel Lidar)

- Programs:
  - Provost’s Core Infrastructure Initiative
  - NSF Major Infrastructure Program (MRI)
  - DoD DURIP Program

- Networking with existing centers & institutes to leverage resources
Corporate & Private Funding

- Corporate and Foundations Relations Office: Blair Lake
- Foundations: Blair Lake
- Special RFPs with partnering companies (GE, Lockheed Martin)
- IP negotiations can be lengthy...
Industrial Partnerships

- Airbus Institute for Engineering Research (AIER)
- Center for Machine Learning (MASCLE)
- Center on Advanced Manufacturing (CAM)
- Cyber-Physical Systems and the Internet of Things (CCI)
- Michelson Center on Convergent Bioscience – Agilent Center of Excellence
- Pratt & Whitney Institute for Collaborative Engineering (PWICE)
- TCC Foundation Center for Reduced Emissions Using Plasma
- USC Center for Artificial Intelligence in Society (CAIS)
- USC-Lockheed Martin Quantum Computation Center
- CiSoft: Center funded by Chevron; possible model for other centers
Expectations: Our Vision

- At least 3 GRAs funded per year
- Fellowships and TAs are in addition to that
- Strongly discourages 25% GRAs on grant budgets
- One PhD graduated per year, one new PhD student taken on
- 5 years in the PhD program per student: 1 as TA, one as fellow, and 3+ as GRA
- Each faculty member should submit at least 2 proposals per year as PI, the range goes to 30+
- Co-PI and other roles are extra and encouraged
- These are minimal numbers: do the calculation for how much it takes to sustain a pipeline of 3+ GRAs given funding rates (~10%) and plan proposal submissions accordingly
Pointers for Getting Research Funding

• The economy can always be in better shape; research support has been steady, no telling what will come next

• Basic advice:
  • Connect with program managers/administrators at federal agencies, go to visit, talk to them
  • Serve on review panels as much as possible
  • Read winning proposals and get people to read your proposals and give you honest feedback
  • Talk to research mentors about the content of your research and your research strategy
  • Get your students engaged early in research, writing papers, and helping with proposals
  • It is necessary to be strategic and well prepared
We Are Here to Help

• Mentoring programs (this is part of it)
• Help with proposal submission (VBA)
• Faculty forums with key visitors:
  • luminaries
  • representatives from funding agencies
• Weekly research gist
• Memos with important news
• Research portal
• Special programs for junior faculty, as well as PhD students and postdocs
Research in the time of COVID-19

- Around mid-March almost all on-campus research stopped.
- Around mid-June on-campus research restarted.
- Current phase 2b: 10’ physical distancing, 30% capacity for experimental and 10% capacity for computational/theoretical research groups.
- Moving to 50% for experimental and 20% for computational next week!
- Every lab needs an approved research restart plan for on-campus research.
- PPEs provided by the school to departments and then to faculty.
- Requirements: (a) PPEs, (b) Physical distancing, (c) Trojanlearn module, (d) Trojancheck, (e) no undergrads.
- FAQ Web sites:
  - [https://viterbischool.usc.edu/covid-19-faq-for-usc-viterbi-researchers/](https://viterbischool.usc.edu/covid-19-faq-for-usc-viterbi-researchers/)
  - [https://we-are.usc.edu/faqs/research-faqs/](https://we-are.usc.edu/faqs/research-faqs/)
Resources for Junior Faculty

• New faculty orientation
• NSF Career award internal review program (2 reviews per proposal by previous winners) with Broader Impacts help (Dr. Katie Mills)
• Cost-share on early career awards (except NSF and NIH, where it is not allowed)
• Travel funds for junior faculty
• Reduced teaching load
• Faculty mentoring program
Mentoring

• Each of you should have a mentor with whom you have a productive relationship

• All pre-tenure faculty have at least one, preferably two, assigned mentor(s); tell us if it’s working

• HOWEVER: assigned mentors are not always ideal
• Tell us your preferred mentor, and we will work to set it up
• Vice Dean Timothy Pinkston will meet with each of you
• Use the following individuals as mentors: assigned mentor, dept. chair, vice deans, (more) senior colleagues you like

• Take the time to network and talk to people
Keep the Dialogue Going

• **Contact info:**
  • Email to me (aoberai@usc.edu) AND assistant: Marjorie Brownbill: brownbil@usc.edu
    For appointments contact Marjorie
  • Nichole Phillips: nicholep@usc.edu 213-740-3237
  • Amanda Reguengo: amandas@usc.edu 213-740-6064

• We move as fast as possible, but please leave enough time for addressing and iterating on issues

• We want you to succeed. Own the school, it’s yours to shape and lead!