NSF Update
STOC 2020

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Algorithmic Foundations
AF
Funda Ergun
Tracy Kimbrel
J. Maurice Rojas (until Sept)
YOUR NAME HERE

Foundations Of Emerging Technologies
FET

Communication and Information Foundations
CIF

Software and Hardware Foundations
SHF
Core Programs in AF

• **CISE Core Solicitation:** coming soon
  – **Small:** up to $500K
    • NO DEADLINES!
    • Panels likely to cover wider ranges of topics
  – **Medium:** up to $1.2M
    • Deadline in fall 2020
    • Write for broad TCS audience

• **CAREER (deadline July 27 Aug 11) & CRII (coming soon)**
  – Can’t submit both in same year
  – Write for broad TCS audience
Research Experiences for Undergraduates

- **REU Supplements (NSF 20-016)**
  - Support for 1-2 Undergrads
  - Summer or during academic year
  - Consider also embedding a request in your next proposal (not included in proposal budget limits)

- **REU Sites deadline Aug 26**
  - Summer projects: ~10 weeks, ~10 students
  - Recruiting for URMs and women
  - Need more AF projects
Other programs for AF community

• **National AI Institutes**
  – $20M Institutes
  – Foundations of ML and Trustworthy AI themes in 2020
  – Revision coming in fall – themes TBD

• **Secure & Trustworthy Cyberspace (SaTC)**
  – No deadlines!

• **Principles and Practice of Scalable Systems (PPoSS)**
  – Multi-disciplinarity required across computing subareas including theory
  – Multi-year solicitation: Annual deadline in January

• **Graduate Research Fellowship Program (GRFP)**
  – Encourage your graduate students and seniors to apply
TRIPODS

• Transdisciplinary Research in Principles of Data Science
  – Institutes for EE, math, stats, TCS
  – Research, curriculum dev., and visioning
• 12 Phase I (startup) awards in 2017
• 15 Phase I awards in 2019
• Phase II (>10M) awards to be announced soon!
  – Must involve a Phase I team
  – Team expansion is encouraged
• Second Phase II planned for 2022
Industries of the Future

Government-wide emphasis on these high-level areas shapes NSF’s funding priorities:

- artificial intelligence (AI)
- quantum information sciences (QIS)
- 5G / advanced communications
- biotechnology
- advanced manufacturing
NSF 2026

- 33 areas for potential new initiatives
- 3 of top 7 have TCS aspects
  - Emergence: Complexity from Bottom Up
  - From Thinking to Inventing
  - Theory of Conscious Experience
2 (OF 10) BIG IDEAS

• CONVERGENT RESEARCH

• Research driven by a specific and compelling problem. Convergence Research is generally inspired by the need to address a specific challenge or opportunity, whether it arises from deep scientific questions or pressing societal needs.

• Deep integration across disciplines. As experts from different disciplines pursue common research challenges, their knowledge, theories, methods, data, research communities and languages become increasingly intermingled or integrated. New frameworks, paradigms or even disciplines can form sustained interactions across multiple communities.

These still have momentum in NSF long-term planning.
COVID-19 impacts

• Panels
  – All-remote through until at least October
  – Still planning for later dates
  – Remote participation always available

• Programs
  – No info yet on specific programs
  – TCS for related problems welcome in AF
  – Remember broader impact criterion
Diversity and current issues

• AF is committed to advancing theoretical computer science research in an equitable and inclusive way

• CISE is actively encouraging Broadening Participation in Computing
  – Equity and Inclusion are key facets

• AF welcomes your input

• AF believes Black lives matter
Proposal writing tips

• Be a panelist
• Novelty, creativity, transformative, high risk/reward
• Understandable to broad TCS community
• Previous work vs. new - clear demarcation
• Laundry list vs. focused themes & explicit conjectures
• Lines of attack – avoid “trust me” feel
• Broader Impacts
  – Previous work
  – Proposed work (explicit plans, measures of success)
Opportunities for Community Engagement!

- Volunteer to be a panelist.
- Explore support for workshops in exciting new areas.
- Inform program directors of research breakthroughs.
- Suggest improvements to NSF processes.
- Join NSF to serve as program officer or division director.
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