



# Proposed NSF Engineering Research Center for Smart Network Infrastructure for Fire Resilience **SNIFFR**

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**SNIFFR**

SMART NETWORK INFRASTRUCTURE  
FOR FIRE RESILIENCE



# Introduction

## What is an NSF ERC?

- The National Science Foundation Engineering Research Center Program provides 5-year (\$15–\$20M) grants to create an engineering research culture that joins transformational fundamental research discovery and technological innovation fostering U.S. competitiveness in the 21st century global economy.



**SNIFFR**

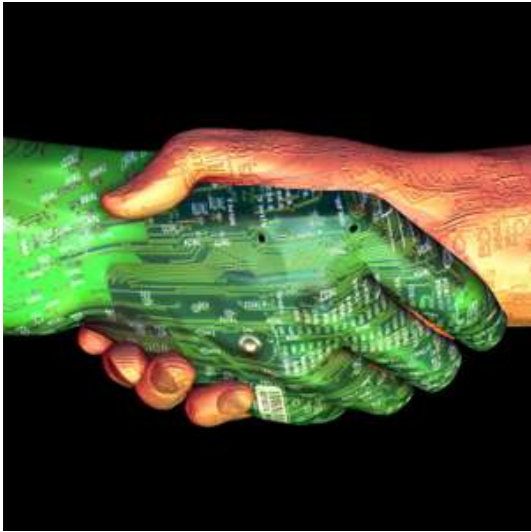
SMART NETWORK INFRASTRUCTURE  
FOR FIRE RESILIENCE



# Overview

- Introduction
- Vision
- Value
- Team
- Approach
- Workforce Development
- Innovation Ecosystem

## Cyber Physical Infrastructure



## Vision

### Eliminate Fire Disaster in the 21<sup>st</sup> Century.

- Fires are rare but ubiquitous
- Disaster can be averted (**prevention and effective response**)

### SNIFFR **Assesses** and **Conveys** Information.

- Synthesizes critical data into useful information.
- Effectively communicates information for optimal decision and action (**occupants, first responders, mitigation systems**).



Value

## Mission

### The SNIFFR System **Focuses on People.**

- Wildland Urban Interface (WUI) | Buildings and Communities | Transportation Systems

### **US Communities and Infrastructure Deserve SNIFFR Technology.**

- Fire safety technology gap must be bridged (i.e. challenges the status-quo)

### The SNIFFR ERC is **unique.**

- Extends and anchors fire safety engineering discipline through **new research connections** (departments and universities).



Value

## US Competitiveness

**The cost of fire accounts for 2.5% of the US GDP with unknown environmental impact.**

**The SNIFFR ERC is **unique**.**

- Industry ripe for disruption and innovation (i.e. challenges the status-quo)
- Cross-cutting focus with achievable scope



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Tuskegee University



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University of Texas



● ● ● ● ●  
**Team**

**Thrust Areas**

**Hazards & Uncertainty**



WPI  
UCSD  
UM

**Sensor**



**Networking**



**Modeling**



**Communications**





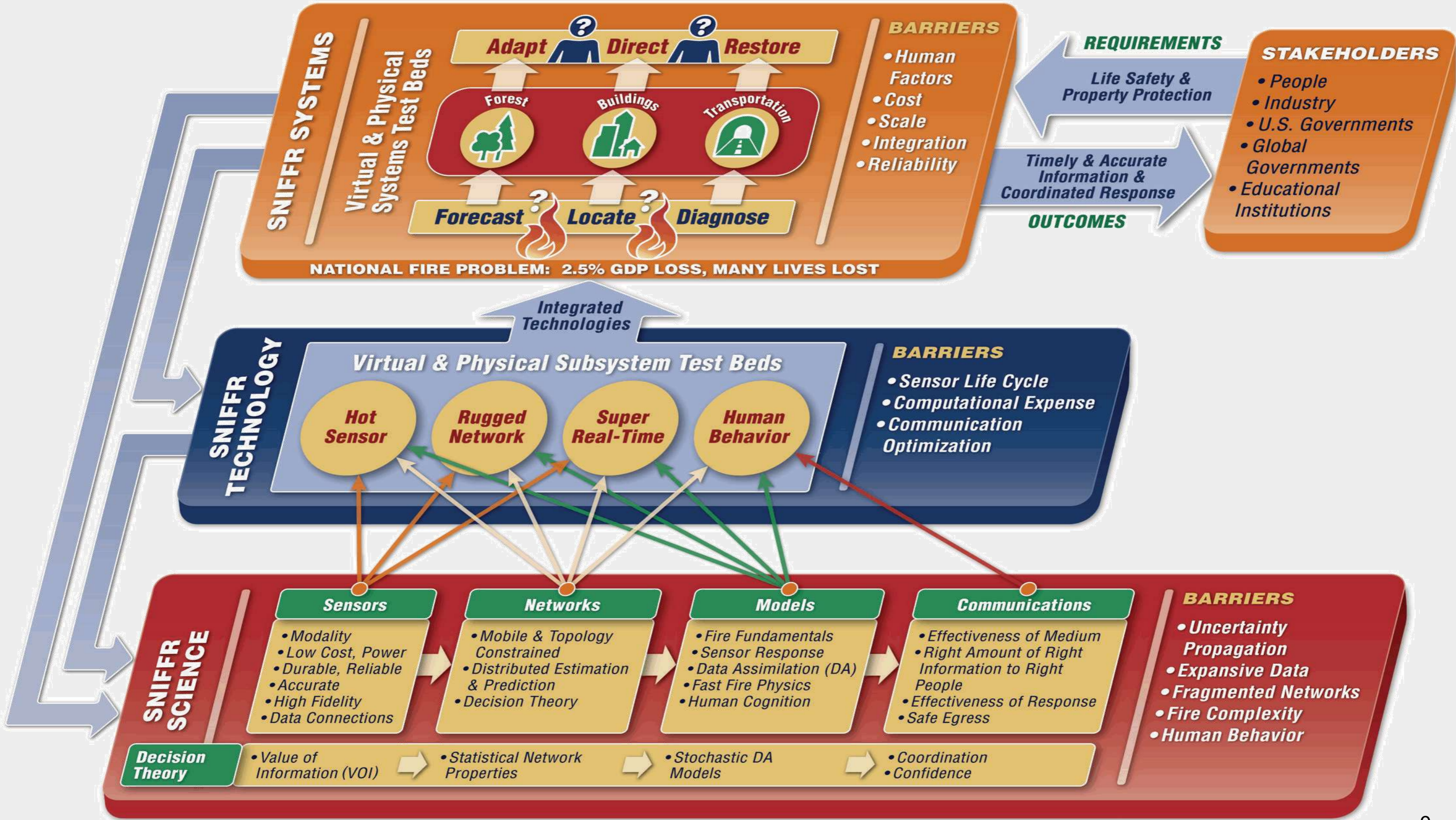
# Team

<b>Academic</b>	Daniel	Aldrich	Purdue	Communications
	Ilkay	Altintas	UCSD	Networking
	Arvind	Atreya	UM	Sensors
	Howard	Baum	UMD	Modeling
	Shuvra	Bhattacharyya	UMD	Networking
	Jessica	Block	UCSD	Sensors
	Alok	Chaturvedi	Purdue	Communications
	Chris	Clifton	Purdue	Modeling
	Raymond	deCallafon	UCSD	Modeling
	Edward	Delp	Purdue	Communications
	Eric	Dietz	Purdue	Communications
	David	Ebert	Purdue	Communications
	Gamal	ElAfandi	Tuskegee	Sensors
	Joseph	Essamuah-Quansah	Tuskegee	Sensors
	DK	Ezekoye	UTAustin	Hazards & Uncertainty
	Michael	Gollner	UMD	Modeling
	Jay	Gore	Purdue	Modeling
	Chris	Hoffmann	Purdue	Modeling
	Andre	Marshall	UMD	Modeling
	Nuno	Martin	UMD	Networking
	Brian	Meacham	WPI	Hazards & Uncertainty
	James	Milke	UMD	Hazards & Uncertainty
	Elaine	Oran	UMD	Modeling
	Dimitrios	Peroulis	Purdue	Sensors
	Gilbert	Rochon	Tuskegee	Sensors
	Yudaya	Sivathanu	Purdue	Sensors
	Fall	Souleymane	Tuskegee	Sensors
	Stanis	Stoliarov	UMD	Modeling
	Peter	Sunderland	UMD	Sensors
	Arnaud	Trouve	UMD	Modeling

<b>Industry &amp; Government</b>	Andre	Bondi	Siemens	Industry & Government
	Pat	Boyer	State Farm	Industry & Government
	Nelson	Bryner	NIST	Industry & Government
	May	Corn	UTC	Industry & Government
	Sergey	Dorofeev	FMGlobal	Industry & Government
	Steve	Edwards	MFRI	Industry & Government
	Anthony	Hamins	NIST	Industry & Government
	Steve	Kerber	UL	Industry & Government
	Amanda	Kimball	NFPA	Industry & Government
	Robert	Locke	Tyco	Industry & Government
	Guido	Poncia	UTC	Industry & Government
	Noah	Ryder	deltaQ	Industry & Government
	Antonio	Vincitore	UTC	Industry & Government



# SNIFFR – Smart Network Infrastructure for Fire Resilience







# Workforce Development

## University Programs

- nanoHUB framework utilized for **FireHUB** an ‘international learning network’
- Multidisciplinary cross-institutional graduate and undergraduate experiences through **ERC Test Bed** framework
- Research Experience for Undergraduates (**REU**) program with ERC member participation

## Pre-college Programs

- Outreach leverages **FireHUB** (e.g. curriculum and activities)
- Young Scholars Program leverages FireHUB leverages **FIRST Robotics Competition (FRC)** – SNIFFR enabled with fire challenge
- Research Experience for Teachers (RET) program leverages FireHUB
  - Special interest in **community colleges**



# Innovation Ecosystem

To be effective and sustainable **the ERC must derive sufficient value from the innovations** that the ongoing research can be self-sustaining, thus a balance between the knowledge and commercial economies.

## Membership Based Collaboration

- Industry and Practitioner members commit through financial & other resources
- Semi-annual workshops to ‘pull’ ERC based on member input
- Champion based recruitment leveraging strong and functioning relationships

## Value Chain Targets

- Initially target sensor and network sectors and insurance and EFR groups
- These groups grasp value and have high level of research engagement

## Innovation and Entrepreneurship Partners

- Strong university based innovation and entrepreneurial resources to drive commercialization process