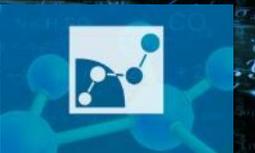




# DELIVERING BREAKTHROUGH SOLUTIONS

## CFD RESEARCH CORPORATION CAPABILITIES OVERVIEW



# Who We Are



CFDR is established as an  
**Innovation Pioneer**  
and technology  
**Thought Leader**  
supporting industry and government



Staff comprised of leaders across  
a multitude of technologies with  
**Education and Experience**  
required to lead advances



We have been awarded  
**65 Patents** and have  
**Out-Licensed 35**  
with royalties or sold/assigned to  
our partners



We have worked on  
**1400**  
**Contracts**  
Currently **80**  
over



CFDR has transitioned  
Technologies  
into the market  
and spun-out  
**20**  
**2 Companies**

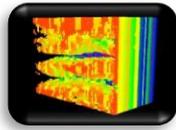
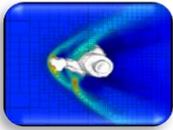


Committed to  
**Supporting our**  
**Community** to improve  
**Quality of Life** for all

# Company Overview



## BUSINESS UNITS



### Research and Development

- Small Business Innovative Research (SBIR) and Small Business Technology Transfer (STTR) Programs
- Critical technologies
  - Aerospace and propulsion
  - Energy and materials
  - Life sciences



### Expert Services

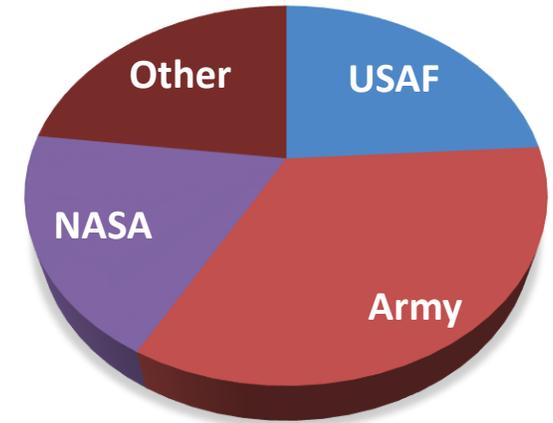
- EXPRESS Blanket Purchase Agreement for Technical Services for Team Redstone (541330)
  - Missile and aviation systems support
  - Protective technologies and energy systems
- Public Health
- Army and Air Force Medical



## FOOTPRINT



## CUSTOMER BASE



## EMPLOYEE-OWNED

**140 EMPLOYEES**

**Cleared 40%**

**PhD 35%**

**Advanced Degrees 70%**

## MATURE INFRASTRUCTURE



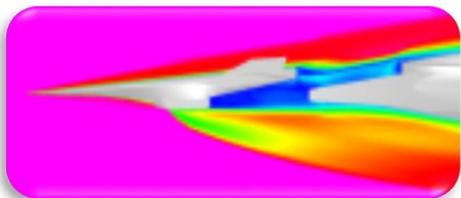
**CMMISVC/2<sup>SM</sup>**  
Exp. 2020-12-01 / Appraisal #30964



**ISO 9001**  
CERTIFIED



## AEROSPACE

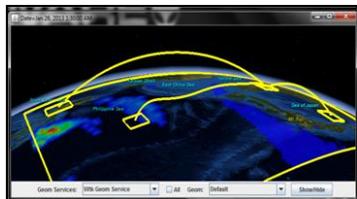
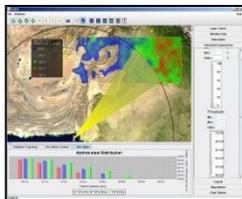


### • Aeromechanics

- Aircraft, missile, launch vehicle aerothermodynamics
- Coupled Aero-servo-thermo-elastic analysis
- Flight dynamics, separation and abort dynamics analysis
- Plasma research and applications
- Model-Order Reduction for complex system simulations

### • Environmental Effects

- Flight simulation aeroheating and particulate erosion
- Software subsystem built in SOA for C4I integration
- Climatology, now-forecasting, satellite and radar data
- Integration with fielded situational awareness software

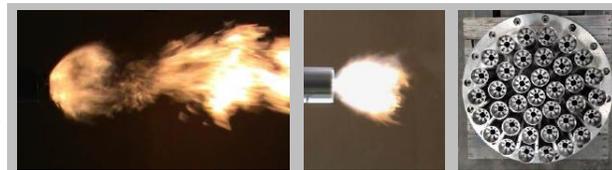


## PROPULSION

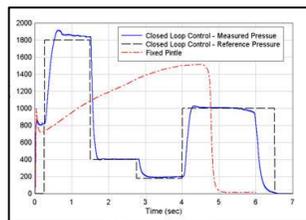


- **Scottsboro Test Facility** for prototype development
  - Air Turbine for Next Generation Jamming Pod
  - Helicopter inlet filter for sand ingestion protection
- **Combustion**, fuel injectors, fuel mixing

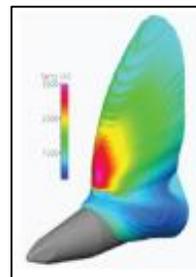
*APTU  
Injector  
Development*



- **Divert & Attitude Control Systems**
- **Gelled Propellant Systems**
- **Throttleable Propulsion**



*Thrust Profile*



*Thruster Modeling*

## ENERGY



### • Energy Storage

- Next-generation thermal batteries
- Solid-state batteries
- Alternative fuel sources
- Nanomaterial-based electrodes
- Battery test and evaluation



*Bio-Battery*

### • Smart Energy

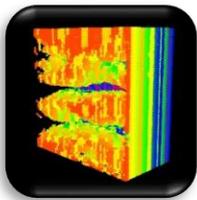
- Advanced energy management
- Battery modeling and simulation
- Grid modernization
- Power and energy analytics



# Capabilities

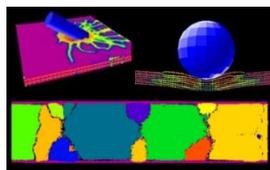


## MATERIALS



### • High Performance Materials

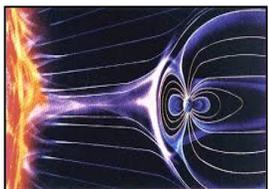
- Material property prediction
- High-performance energetics
- High-temp material & coatings



Fracture Dynamics

### • Radiation Effects

- Electronics and materials
- Radiation environments
- Application integration



Multi scale tools with links to macro scale platforms like CFD

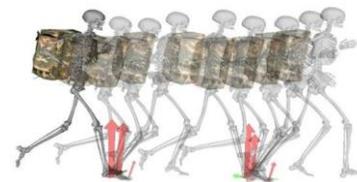
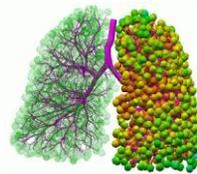
### • Additive Manufacturing

- Process optimization
- Models linking build process to finished part properties
- Applications related to certification & qualification

## LIFE SCIENCES



- **Warfighter Protection:** Traumatic Brain Injury, Improved Helmets/Pads/PPE, Vehicle Crew Injury
- **Warfighter Performance:** Lightening the Load, Spinal/Shoulder/Neck injury, Pain & Fatigue
- **Personalized Health Apps & Portal:** Asthma, Burn Injury, Opioids, Warrior Health, Vestibular Rehabilitation
- **Drug Delivery, PK/PD, Toxicity Modeling**



- **Microfluidic biochips** for sample preparation and environmental, biological and clinical diagnostics
- **SynVivo** for Drug Discovery



## CYBER SECURITY

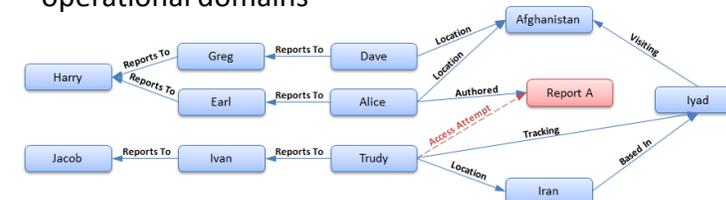


### • Protective Technologies

- Verification, validation, and accreditation of critical information
- Electronic component evaluation for weapons systems
- Security of FPGAs, ASICs, and components
- Modeling of mitigation approaches

### • Trust and Access

- Efficient methods of establishing trust in information from Service-Oriented Architectures & Big Data
- Access control and awareness via logical proximity
- True assessment of "need-to-know"
- Beyond spatial, temporal, organizational, and operational domains

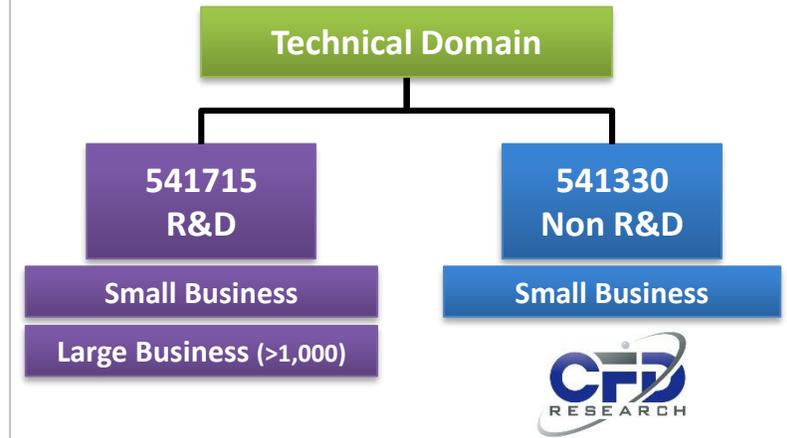


# EXPRESS BPA Award



CFD Research Awarded Blanket Purchase Agreement (BPA) for Expedited Professional and Engineering Support Services (EXPRESS)

## NEW NAICS CODE



## LARGEST CUSTOMERS



## REQUIREMENTS

PWS Area	Subparagraphs																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3.01 Artificial Intelligence																				
3.02 Aeromechanics Technology																				
3.03 Airworthiness Qualification/Release																				
3.04 Cyber Security and Information Assurance																				
3.05 Electronics/Avionics/Visionics/Survivability Equipment																				
3.06 Environmental/Safety Initiatives																				
3.07 Guidance Technology - Guidance Analyses																				
3.08 Guidance Technology - Electronics & Computer Technology Support																				
3.09 Guidance Technology - Weapon System Guidance																				
3.10 Industrial Operations																				
3.11 Infrared																				
3.12 Image and Seismic, Acoustic, Magnetic (SAM) Electromagnetic (EM) Sig																				
3.13 Manpower & Personnel Technical Support																				
3.14 Manufacturing Science and Technology																				
3.15 Navigation and Control																				
3.16 Optics and Laser																				
3.17 Obsolescence Management																				
3.18 Product Assurance																				
3.19 Production Engineering																				
3.20 Propulsion Systems/Technology																				
3.21 Radio Frequency Technology																				
3.22 Systems Engineering																				
3.23 Structures and Materials																				
3.24 Space Related Technical Functional Specialty Area																				
3.25 Systems Simulation and Modeling																				
3.26 Software Engineering																				
3.27 Technical Data Management																				
3.28 Test and Evaluation																				
3.29 Test, Measurement, and Diagnostic Equipment/Nondestructive Test Equipment																				
3.30 Warheads																				

- 30 Technical Areas
- Over 200 Requirements

## TEAM

