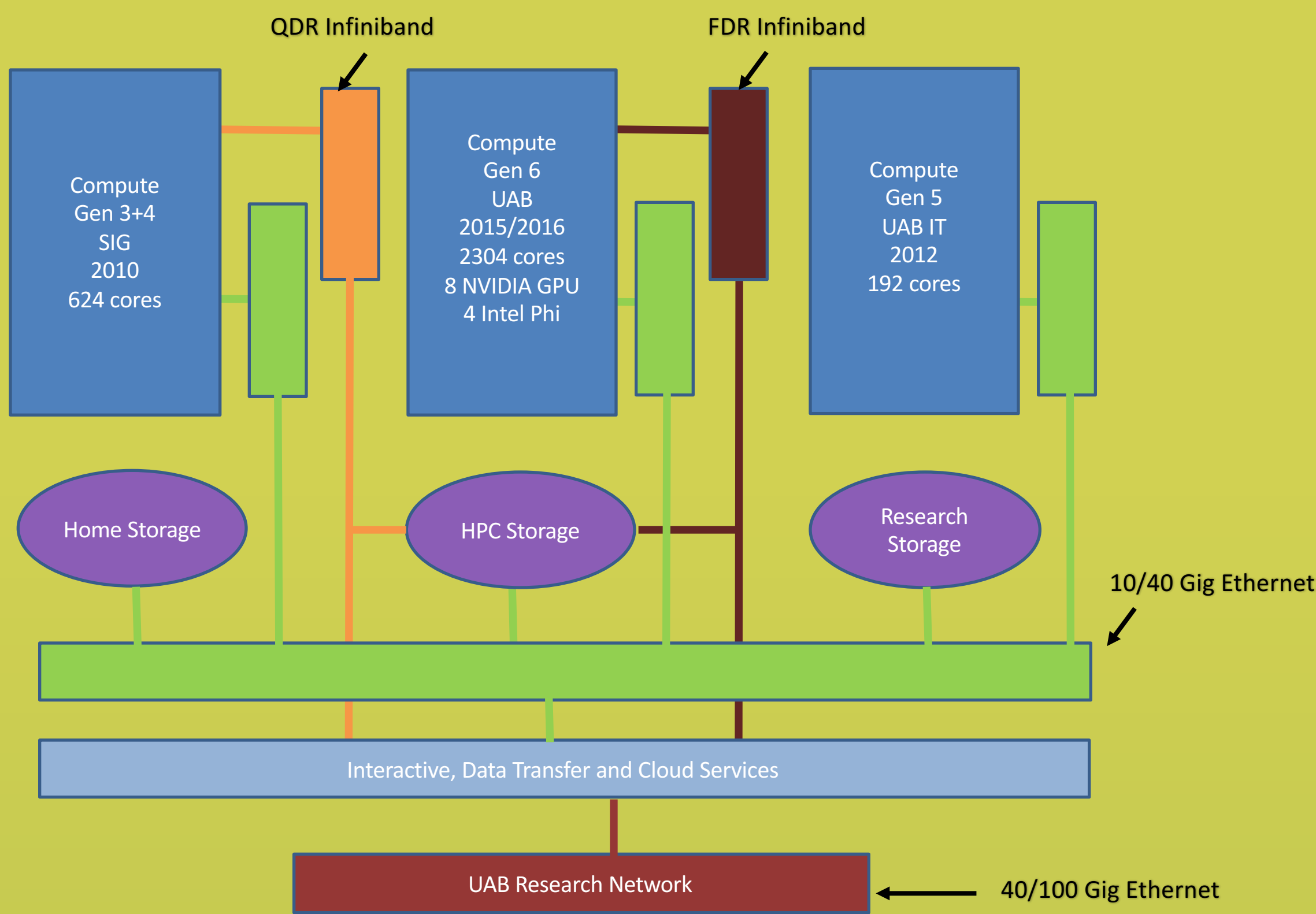# Research Computing Support
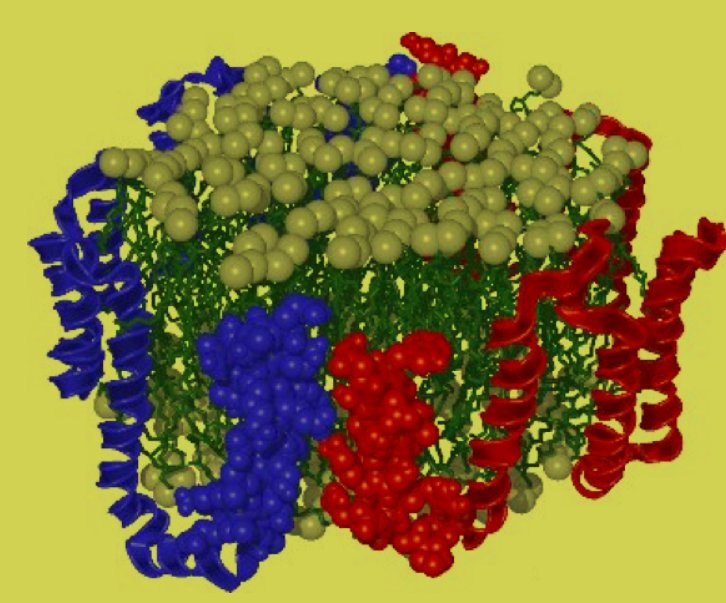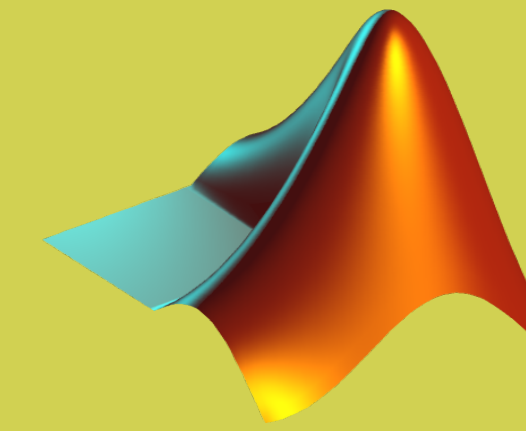
brought to you by UAB IT
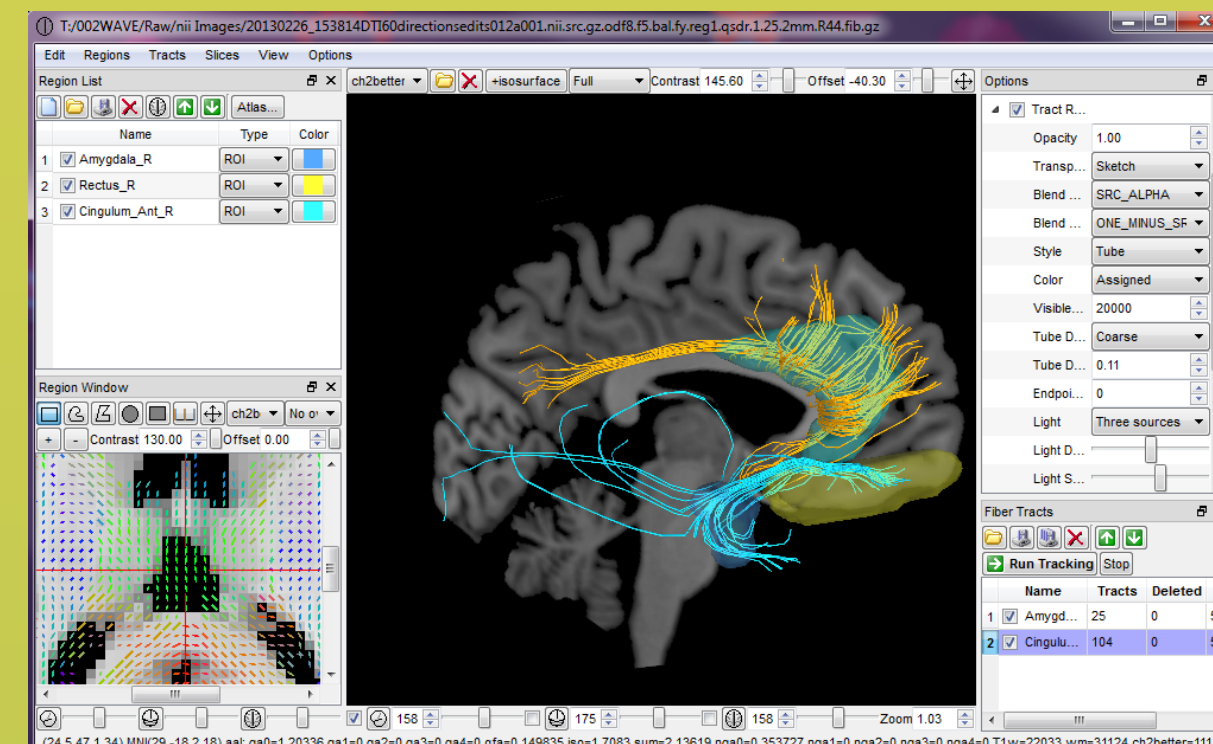

Research Computing System

QDR Infiniband   FDR Infiniband

Compute Gen 3+4 SIG 2010 624 cores

Compute Gen 6 UAB 2015/2016 2304 cores 8 NVIDIA GPU 4 Intel Phi

Compute Gen 5 UAB IT 2012 192 cores

Home Storage   HPC Storage   Research Storage

10/40 Gig Ethernet

Interactive, Data Transfer and Cloud Services

UAB Research Network

40/100 Gig Ethernet

UAB Networks

your connection to the world

Alabama

Huntsville
Atlanta
Birmingham
Tuscaloosa

UASRON is a high bandwidth lambda network owned by UA System that connects UAB to Internet2. UASRON is a Dense Wave Division Multiplex (DWDM) Network, analogous to a 40-Lane, bi-directional, Data Highway. Each lane (channel) can carry a payload of 10 Gigabits per second (Gbps).

UAB is building a dedicated **40 Gbps research network**. It will offer 10 Gbps connections from research labs to the shared computational facility. It will provide access to 10 Gbps data transfer rates for researchers accessing large datasets from external data repositories and national computational resources through the campus Internet2 connection.

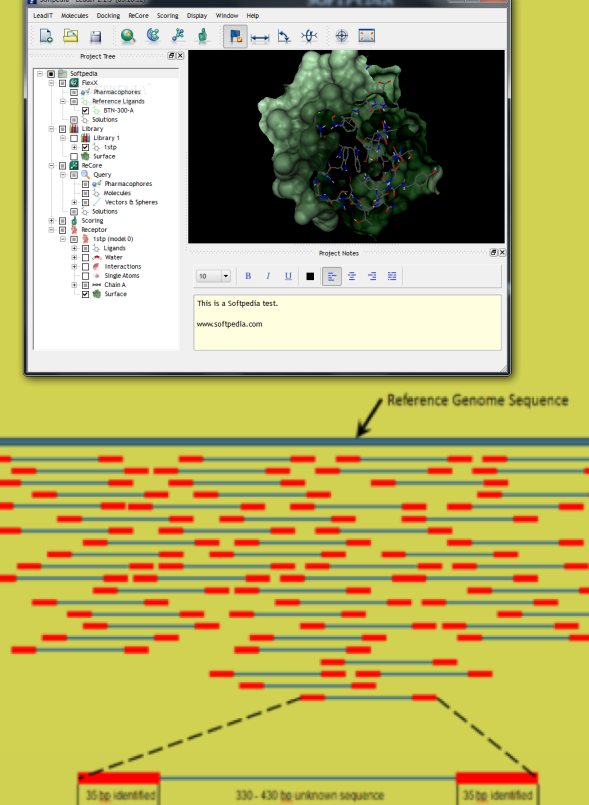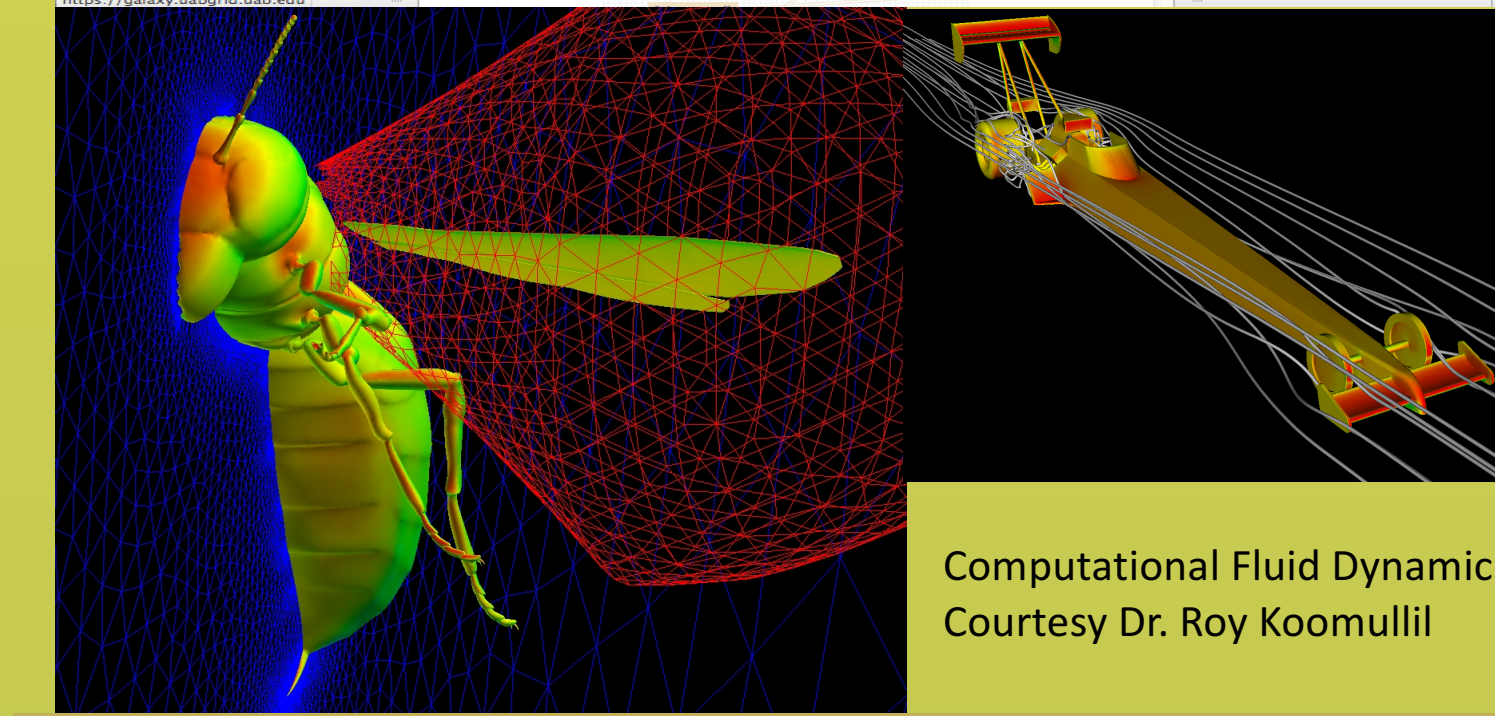Figure 1. Overall architecture of the proposed networking infrastructure.

Research Apps

solutions built to order

From left (Clockwise): NAMD, LeadIT, Data mapped to a reference genome

DSI Studio, Courtesy: Muriah Wheelock, Graduate Research Assistant

Computational Fluid Dynamics Courtesy Dr. Roy Koomullil

MATLAB, Auto-docking via Condor , AFNI, Gromacs, NAMD, Amber, FSL, GNU Scientific Toolkit, etc…

A large variety of **High Performance Computing** apps help make sense of piles of data and model complex systems. Designer apps help speed up tasks and fill in gaps whether its world wide computing, tissue banking, cohort discovery, or data archiving.

Developer Accounts

an open platform to build research

Our platforms, languages, and collaboration tools make it easy to build solutions, document code, record changes, track bugs and collaborate across organizations. Research Computing at UAB gives scientists and researchers a massive, on-demand, virtual storage cloud using **OpenStack** and **Ceph**.

HPC User Portal

Computing Trends

Job Profiles FY 2015		
	Percentage	Hardware Required
Single core	31.5%	Any Computer
SMP	8.5%	Multi-core Node
MPI	60%	Infiniband

Interactive Compute Hour Growth			
2012	2013	2014	2015
0.1K	11K	30K	78K

MATLAB use 2015/2016	
Users	Installations
2377	2471

• This data has been calculated on cheaha.uabgrid.uab.edu, and doesn't include usage on new nodes

Compute hours by School FY 2015

- 27% School of Medicine
- 33% School of Public Health
- 35% School of Engineering
- 5% Others
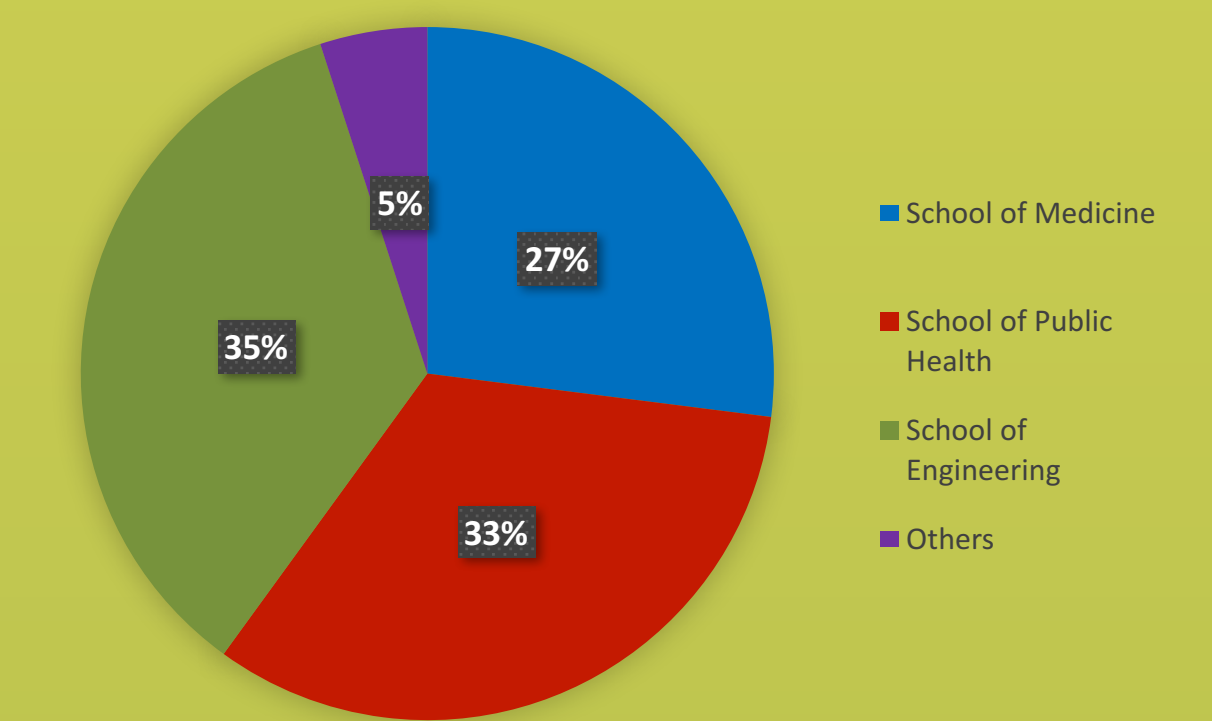
A growing resource fabric: combining funds from research Awards and sustained UAB IT investments to fund on-going expansion of compute, network, and storage capacity and maximize the impact and availability of acquisitions.

The Team

An engaged professional staff collaborates with investigators to provide infrastructure to maximize the impact of research

Puri Bangalore
Interim Director
Research Computing
CIS / UAB IT

John-Paul Robinson
Software Architect
Research Computing
UAB IT

Thomas Anthony
Research Associate
Research Computing
UAB IT

Ravi Tripathi
Software Developer
Research Computing
UAB IT

Mike Hanby
Information Systems Specialist
Engineering / UAB IT

Bob Cloud
Executive Director
Infrastructure Services
UAB IT

Keith Johnson
Director
Infrastructure Services
UAB IT

Ed Harris
Asst. Director
Infrastructure Services
UAB IT

Matthew Sensintaffar
System Administrator
Research Computing
UAB IT

Bill Bradley
System Programmer
Infrastructure Services
UAB IT