Research

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Senior Associate Dean
## Making CST > Parts

<table>
<thead>
<tr>
<th>MATH</th>
<th>CHEMISTRY</th>
<th>PHYSICS</th>
<th>EES</th>
<th>CIS</th>
<th>BIOLOGY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High-Performance Computing</td>
<td>Data Analytics</td>
<td>Advanced &amp; Strategic Materials</td>
<td>Energy &amp; Plasmonics</td>
<td>Genetics &amp; Genomics</td>
</tr>
</tbody>
</table>

Cross-cutting Themes Drive CST Research

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**TEMPEL UNIVERSITY**

College of Science and Technology
College of Science & Technology Centers and Institutes

Center for Biophysics & Computational Biology (CB2: Ron Levy)
Center for Data Analytics & Biomedical Informatics (DABI: Zoran Obradovic)
Center for Biodiversity (Cb: Blair Hedges)
Center for Materials Theory (John Perdew)
Center for Genetics & Genomics (CCGG: Jody Hey)
Center for Networked Computing (CNC: Jie Wu)
Center for Advanced Photonics Research (CAPR: Rob Levis)
Center for Biotechnology (Antonio Giordano)
Institute for Genomics & Evolutionary Medicine (iGEM: Sudhir Kumar)
Institute for Computational Molecular Science (ICMS: MLK)
Big Data Institute (BDI: Paul Pavlou & Zoran Obradovic)
Temple Materials Institute (TMI: MLK) $$$ ARL (VPR) $$$ ($5 Million/2 years)
arin $$$$ DOE EFRC $$$ (CCDM: John Perdew) ($12 Million / 4 years)
Center for the Computational Design of Functional Layered Materials
CST: Strength Through Targeted Collaboration

Center for Computational Design of Functional Layered Materials $3M/year since 2014
DOE Energy Frontiers Research Center (1 of 36 in Nation)
Building a hydrogen economy for clean energy
15 Groups in Physics and Chemistry

Center for Advanced Photonics Research $1.75M/year since 2002
IED detection $5M, Nanomaterials by Design $4M
Tissue Imaging $1M (Traumatic Brain Injury)
5 Groups in Chemistry and Physics plus teaming with Katz School of Medicine, Lockheed Martin

Center for Data Analytics and Biomedical Informatics $700K/year since 2011
Estimate global distribution of a continuous geophysical phenomenon (Climate Prediction).
Predict disease spread, hospitalization cost, (re)admission rate, mortality from patient data

Global Data Bases

Predict Disaster:
Hurricane/Typhoon

Then Predict Disease Out Break
CST SUCCESS STORIES

Institute for Computational Molecular Science

- Largest computer cluster in greater metropolitan area
- High performance computing expertise harnessed to build the new Owl's Nest and expand heavily into Data Science
- ICMS hosts machine for DOE EFRC and NIH (Levy + FCCC), and also serves users from CLA, ENG, Business, Law...
- 500 dedicated users of ICMS/Computer Services machines

Center for Biodiversity

- Discovered 124 new species
- Initiated cryobank at Temple for DNA of endangered species
- Established three national parks in Haiti

Institute for Genomics and Evolutionary Medicine

- Hires propelled Temple University to top 18 in citations in the world
CST Future Directions and Goals

Areas for investment

- Super resolution microscopy and spectroscopy/cryogenic electron microscopy (TMI)
- Big Data and Data Science (DABI, ICMS)
- Traumatic brain injury through: big data (IGEM), imaging (CAPR), drug discovery for pain management (ICMS, CB²)

Goals:

1. Keep faculty that we have!
   Named Chairs for young faculty
2. Build Temple Materials Institute:
   Join with Drexel and Penn to build Pennsylvania south east regional “Center of Excellence in Materials”
3. Contribute to challenge of Global Change through the Center for Biodiversity.
Snapshot: CST Research

- Sum More than Six Departments
- Cross-Cutting Research Themes
- Created Centers & Institutes
- Impact Across Schools/Colleges