

A futuristic cityscape with a large white spaceship in the foreground and a large dome structure in the background. The scene is set against a bright, hazy sky with soft clouds. The spaceship is a sleek, white, multi-engine vehicle with a prominent nose and large wheels. It is parked on a platform. In the background, there are several large, white, dome-shaped structures, possibly part of a space station or a futuristic city. The overall atmosphere is one of advanced technology and exploration.

**THE FUTURE IS NOW**  
**Emerging Industries &**  
**Technologies**

# THE FUTURE IS HERE!



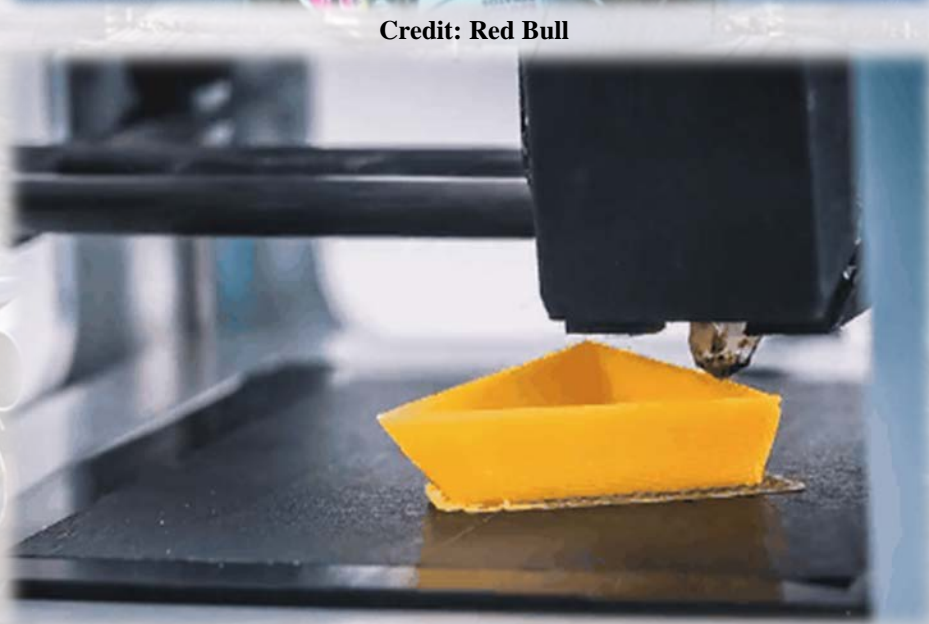
Credit: Virgin Galactic



Credit: Red Bull



Credit: <http://iop.harvard.edu/>



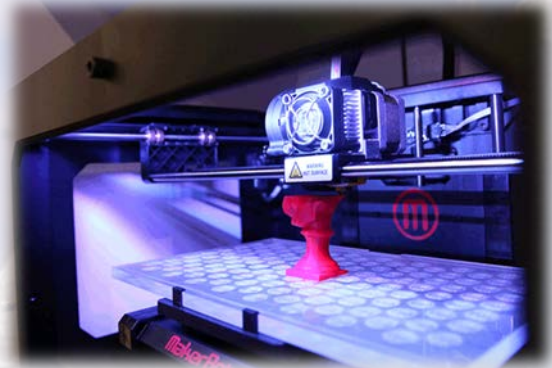
Credit: <https://maker.tufts.edu>

# 3D PRINTERS

- Printers that can produce 3D objects.
- Rapidly growing.
- Can print:
  - Food
  - Organs
  - Medicine
  - Rocket Parts
  - Prosthetic Limbs
- 4D printing is already on the way.



Credit: Brian Walker/AP



Credit: Seimond Chan



Credit: www.theatlantic.com



Credit: Bespoke Innovations



Credit: Skylar Tibbits

# SELF-DRIVING CARS

- Cars that can drive themselves.
- Dependent upon a variety of sensors to “see” where it’s going (e.g. LIDAR, Radar, GPS, cameras).
- Many benefits, including improved safety.



Credit: <https://electrek.co>



Credit: Mercedes-Benz

# SPACE TRAVEL

- There is now an industry that builds and test spaceships.
- Happening in Mojave, CA.
- Sub-orbital flights to be offered in the near future.
- Eventually, trips to LEO (where the ISS is) and around the moon are planned.



Credit: Virgin Galactic



Credit: The Spaceship Company

# UNDERWATER LIVING

- Restaurants and hotels already exist.
- Plans for:
  - Large-Scale Hotels
  - Residents



Credit: Conrad Hotels & Resorts



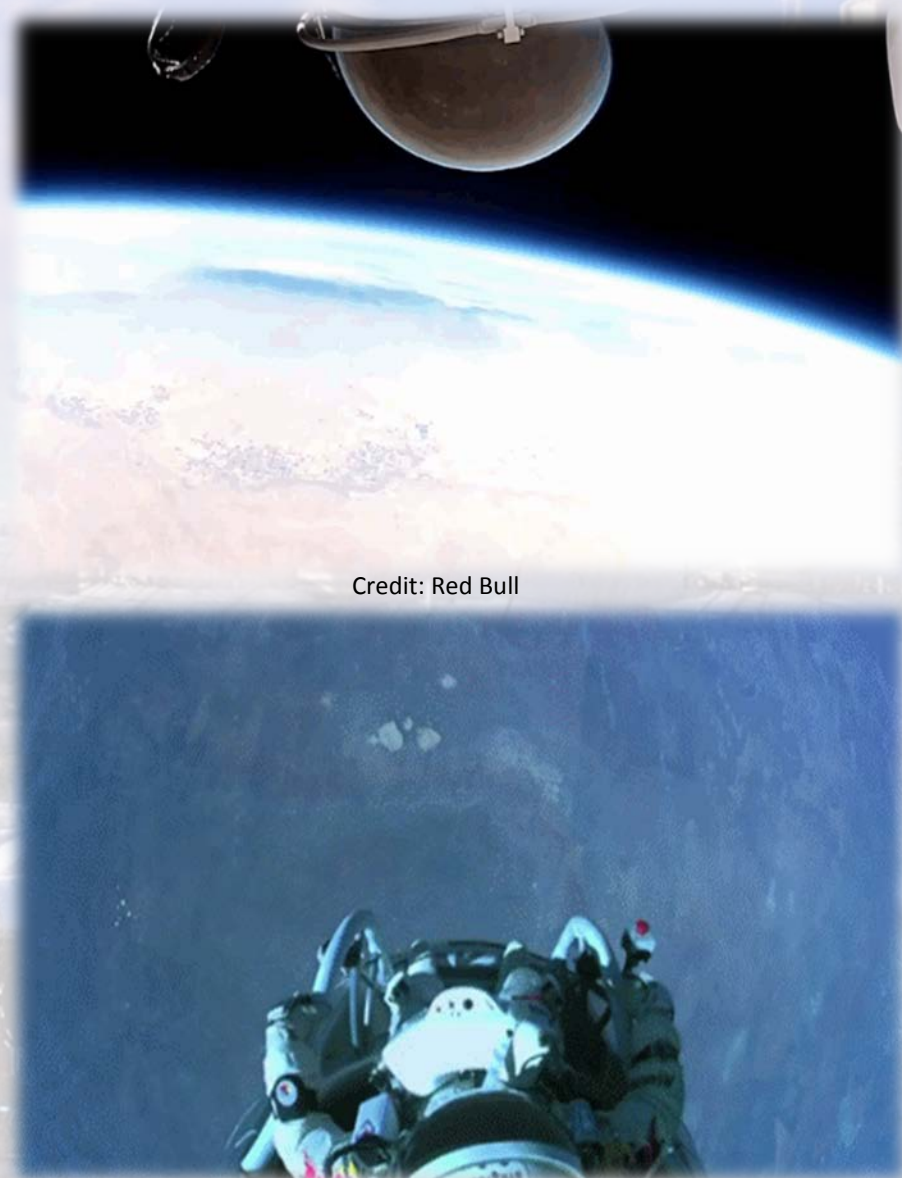
Credit: Poseidon Undersea Resort



Credit: Aqua Creations

# STRATOSPHERE JUMPING

- Jump from the edge of space.
- Successfully attempted in 2012.
- Spacesuits currently being developed.
- Available in the near future.



Credit: Red Bull

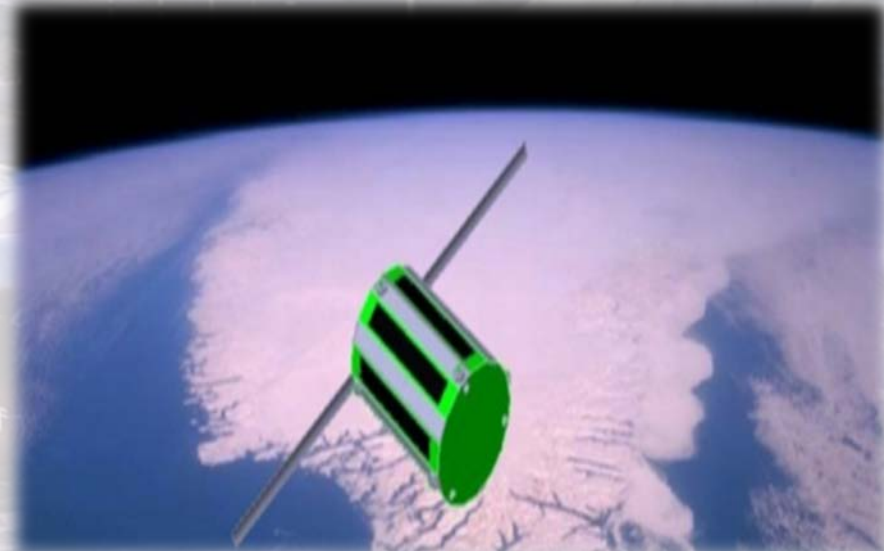
Credit: Red Bull

# LOW-COST SATELLITES

- Commonly referred to as CubeSats.
- Fast-growing industry.
- NASA recently deployed several from the ISS.
- Applications:
  - Astronomy
  - Earth Observation
  - Internet Access
  - Technology Demonstration



Credit: NASA



Credit: Interorbital Systems



# SMART MANUFACTURING

- When sensors and other technologies are embedded throughout the manufacturing process.
- Allows for real-time problem identification.
- Enables a business to identify an irregularity or problem more quickly than it otherwise would be able to.
- Example: Production of Cars



Credit: [www.atlbattery.com](http://www.atlbattery.com)



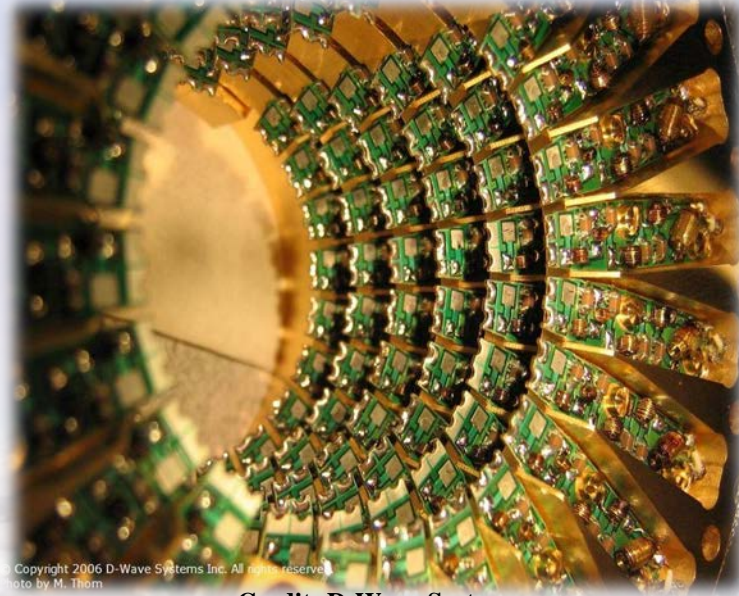
Credit: [www.rockwellautomation.com](http://www.rockwellautomation.com)



Retrieved from [www.recode.net](http://www.recode.net)

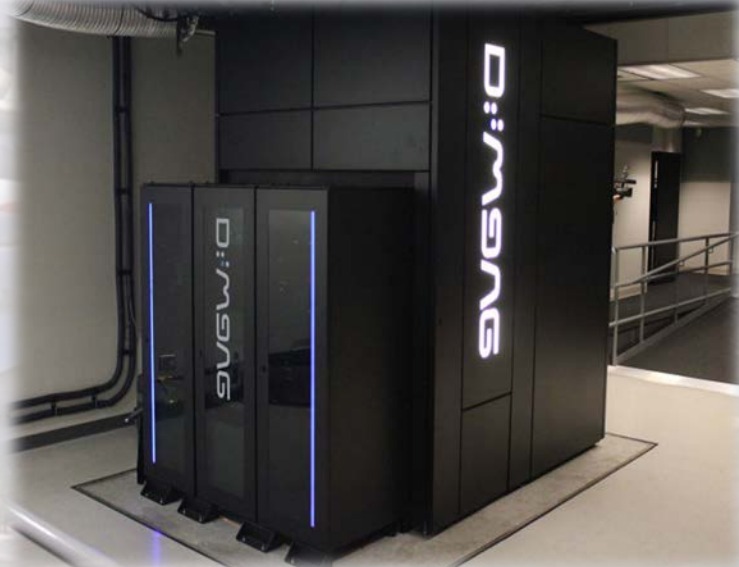
# QUANTUM COMPUTERS

- A computer that harnesses quantum phenomena for the manipulation and storage of data.
- Solves the problem of what to do with large amounts of data, which is a growing concern.
- Example: Bioinformatics



Copyright 2006 D-Wave Systems Inc. All rights reserved.  
Photo by M. Thom

Credit: D-Wave Systems



Credit: D-Wave Systems

# INTERCONNECTIVITY

- Huge amounts of data generated from sensors.
- Real-time data analysis requires critical thinking.
- Need for technological competency to ensure big data (generated from day-to-day operations) doesn't overwhelm a business.
- Deficiencies already exist (e.g. cybersecurity).



Credit: Matthew Butler



Retrieved from <https://blogs.harvard.edu/jeanlouprichet/>

# CYBERSECURITY

- Small and medium-sized businesses are not exempt from having data breaches.
- If data has value, it becomes of interest to those who would benefit from acquiring it, regardless of legalities.



Credit: Rawpixel/Thinkstock



Credit: map.ipviking.com

# S.T.E.M. IS THE FUTURE

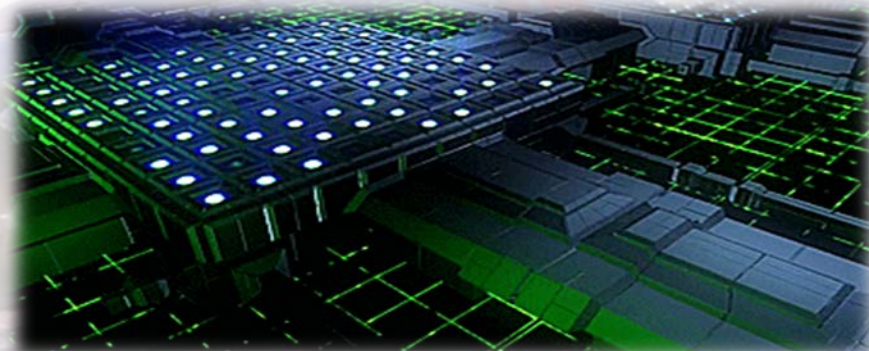
- Drives Innovation
- Creates High-Paying Jobs
- Solves Problems
- Improves Quality of Life
- Creates a Better World for Everyone
- Limitation: many don't know how to prepare students for this future.



Credit: Sean Goebel



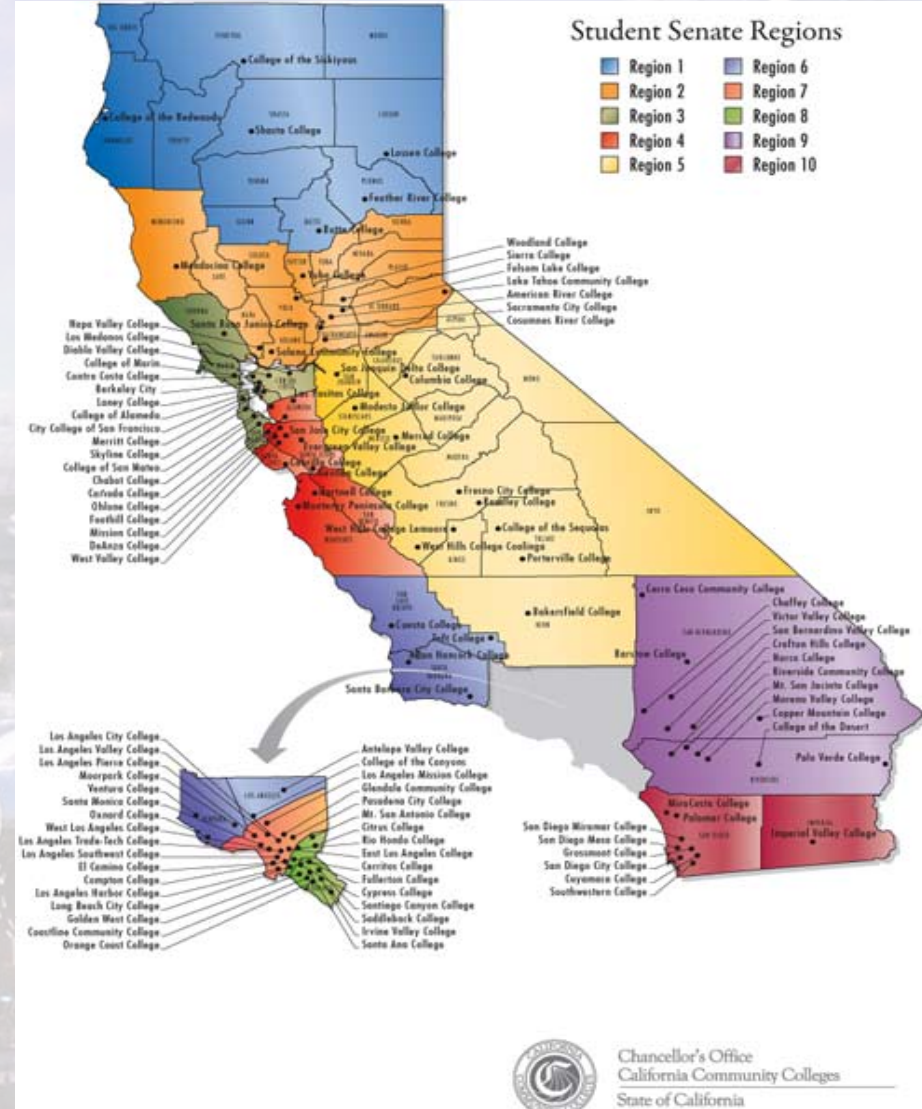
Credit: NASA



Credit: <http://therundownlive.com>

# ROLE OF THE COMMUNITY COLLEGE SYSTEM

- Serves as the backbone for training of the existing & future workforce across all sectors and industries.
- New workforce competencies needed in training workers for emerging industries & technologies.



# OUR ROLE AS EDUCATORS & PROFESSIONALS

- We can all contribute to a better tomorrow.
- Whether in STEM or not, we are all positioned to effect positive change in education and the workforce.



Credit: City of San Diego



Credit: City of San Diego

# WHERE WE GO FROM HERE

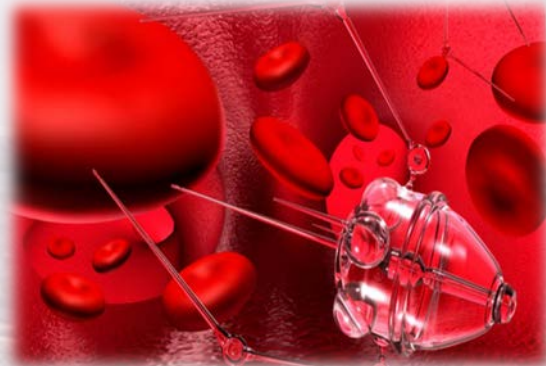
- Artificial Intelligence
- Nanites
- Augmented & Virtual Reality
- Bioluminescence
- Genomics
- Carbon Nanotubes



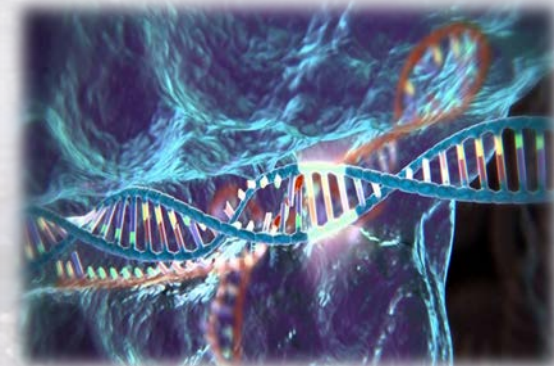
Credit: Aldebaran Robotics



Credit: Gyula Bodonyi



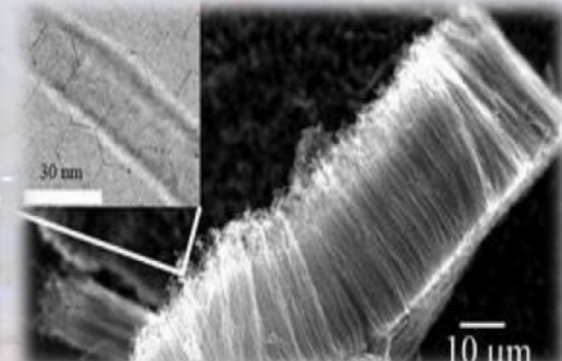
Credit: North Carolina State University



Credit: MIT



Credit: Getty Images



Credit: UC San Diego