TSTC Emerging Technologies
&
The 5th World

Texas Industry Cluster Initiative Meeting
December 14th 2005

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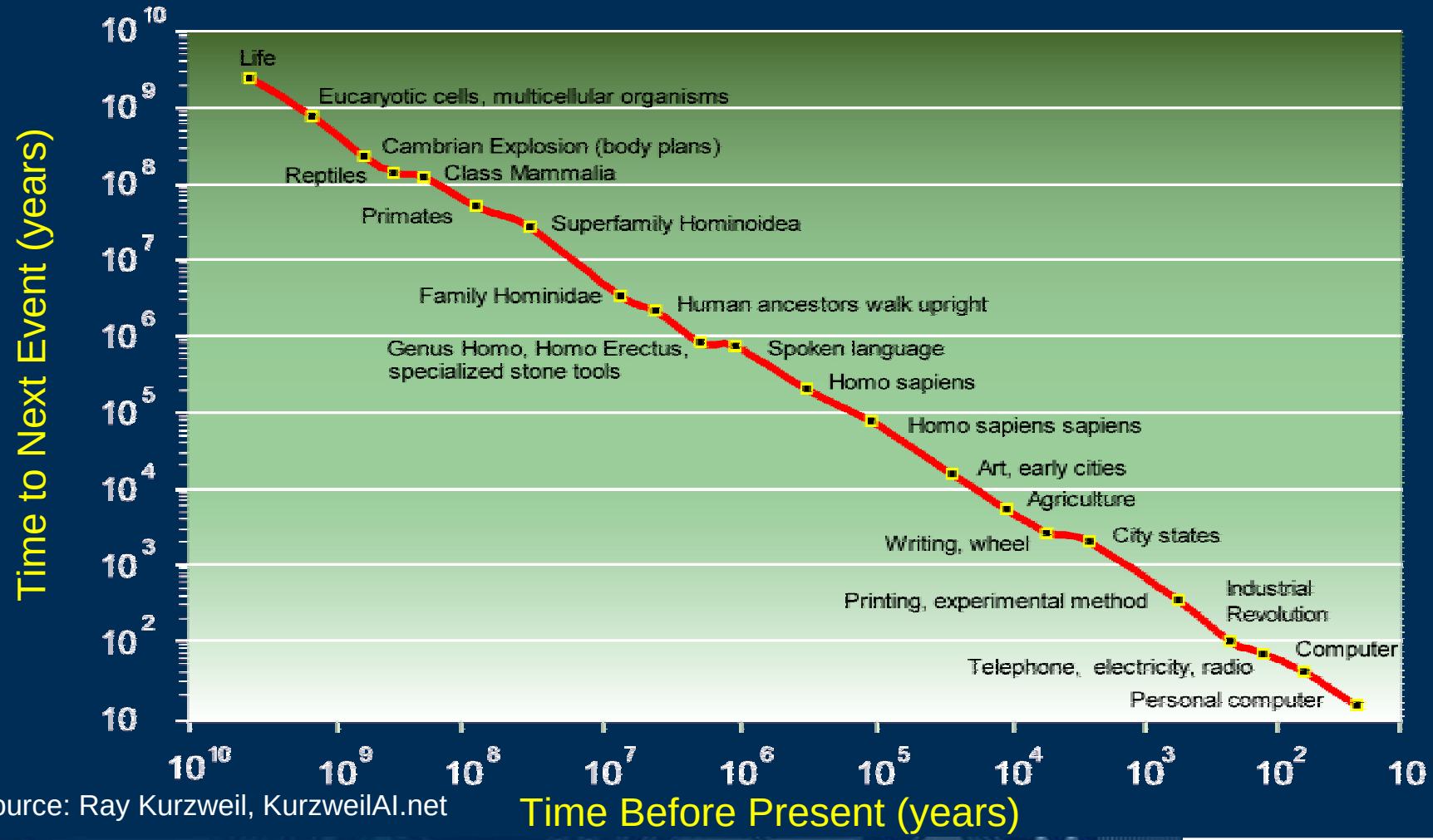
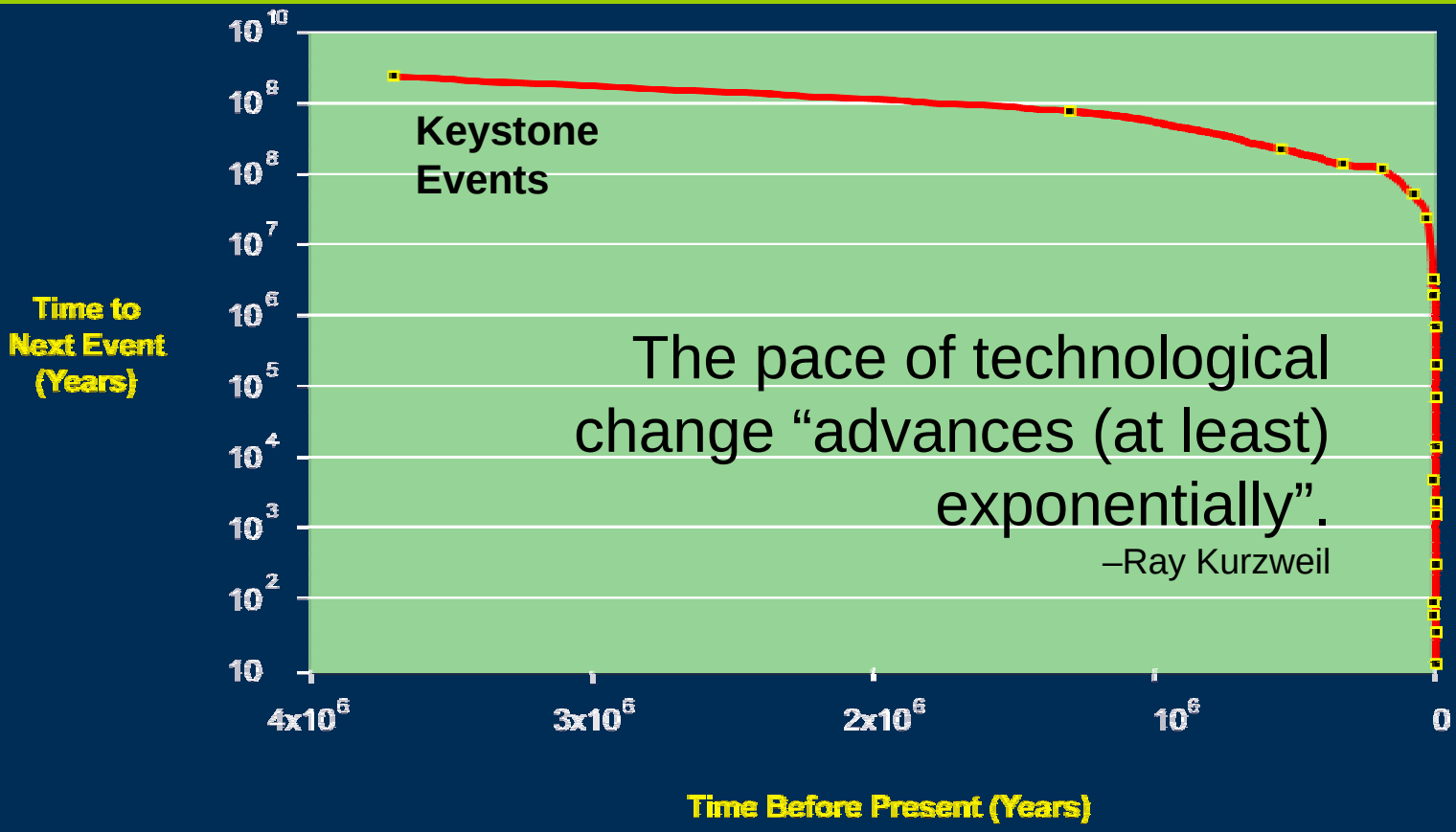
Kurzweil's Countdown to Singularity

"The Paradigm Shift Rate is now doubling every decade."



Source: Ray Kurzweil, KurzweilAI.net

Kurzweil's Exponential Pace of Innovation



The pace of technological change "advances (at least) exponentially".

–Ray Kurzweil

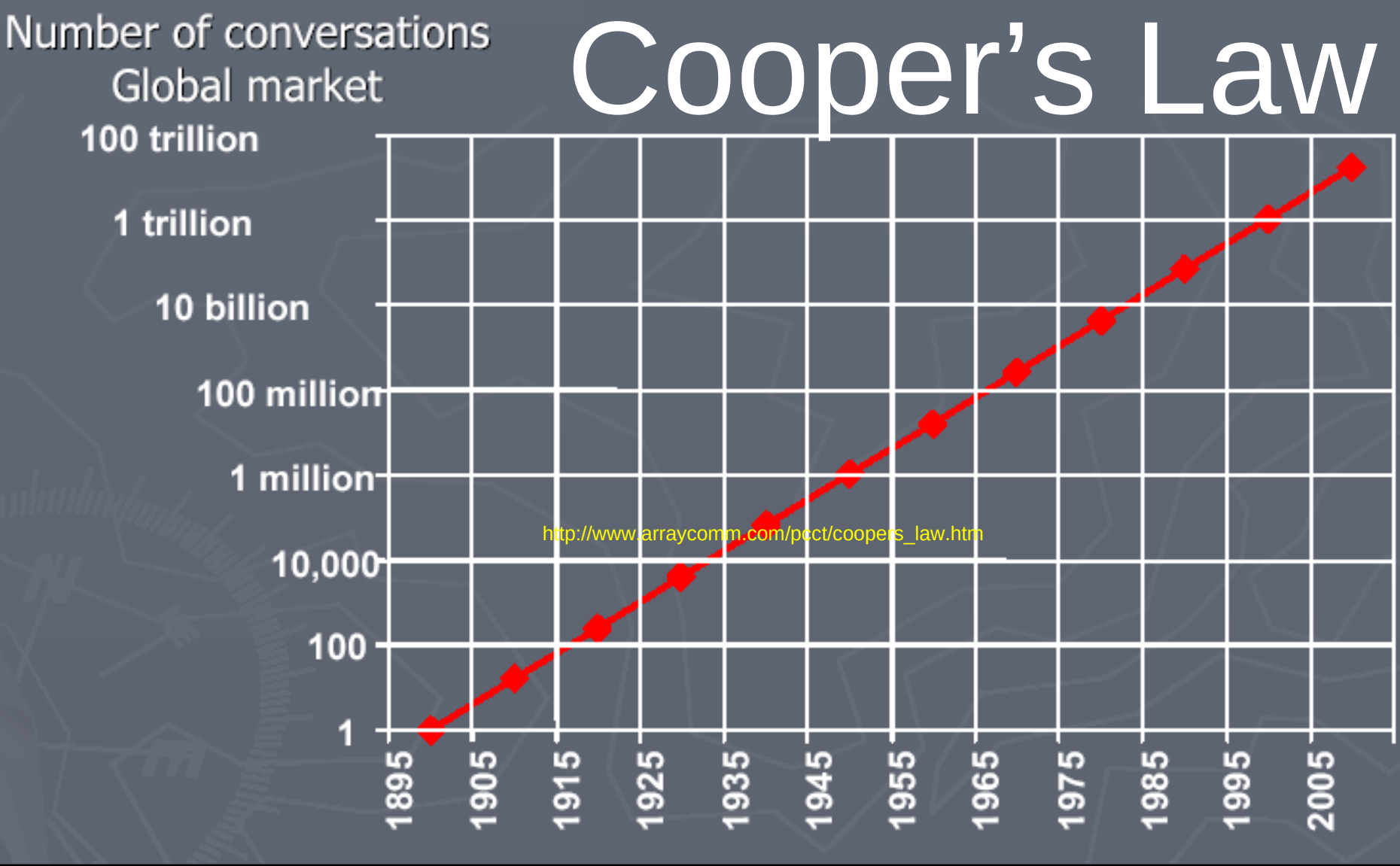
Source: Ray Kurzweil, KurzweilAI.net

Ray Kurzweil

An analysis of the history of technology shows that technological change is exponential, contrary to the common-sense "intuitive linear" view. “So we won't experience 100 years of progress in the 21st century -- it will be more like 20,000 years of progress (at today's rate).”

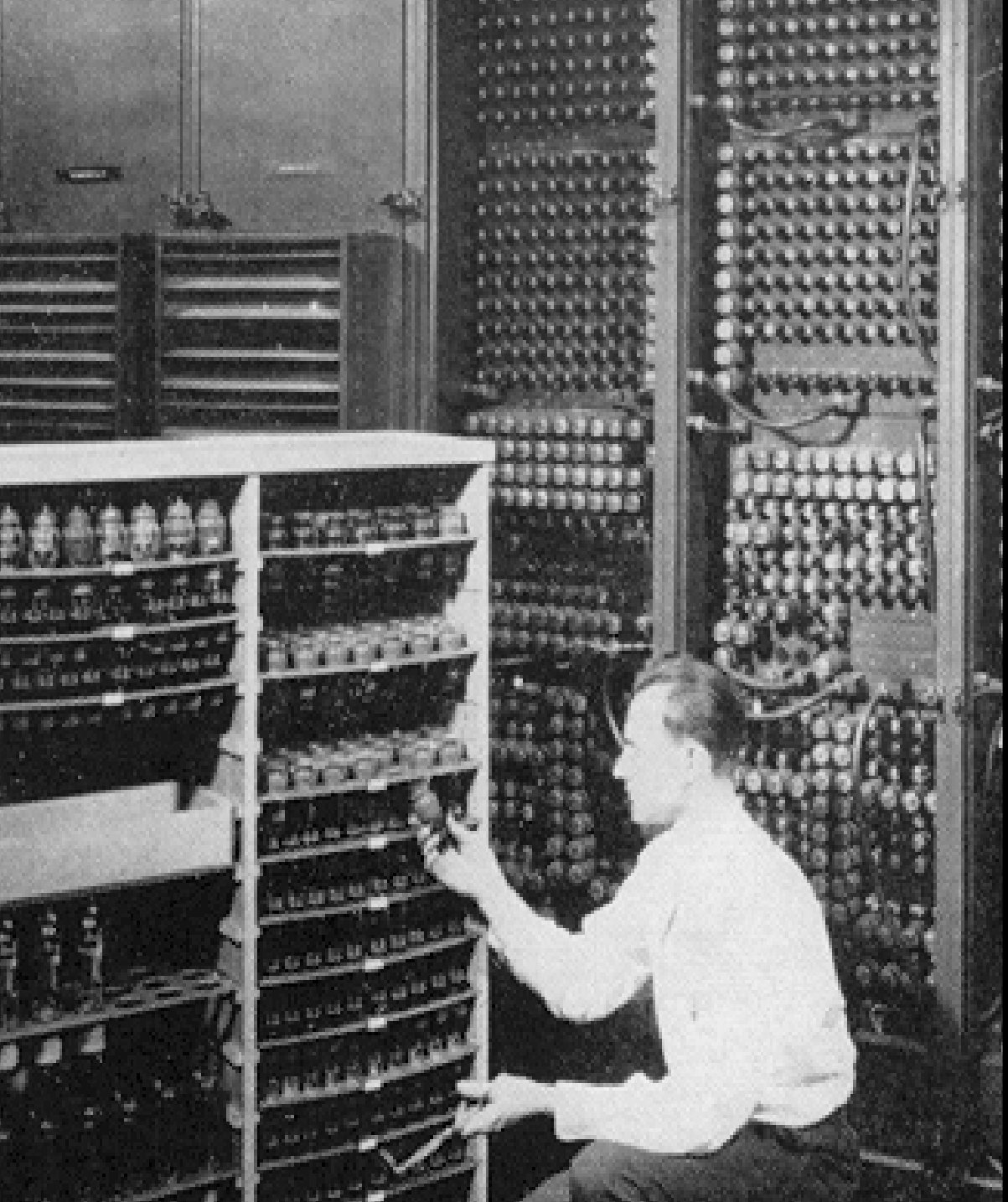
1

Cooper's Law



Martin Cooper's Law - the no. of conversations (voice and data) conducted over a given area, in all of the useful radio spectrum has doubled every 21/2 years for the last 105 years since Marconi, 1895.

2

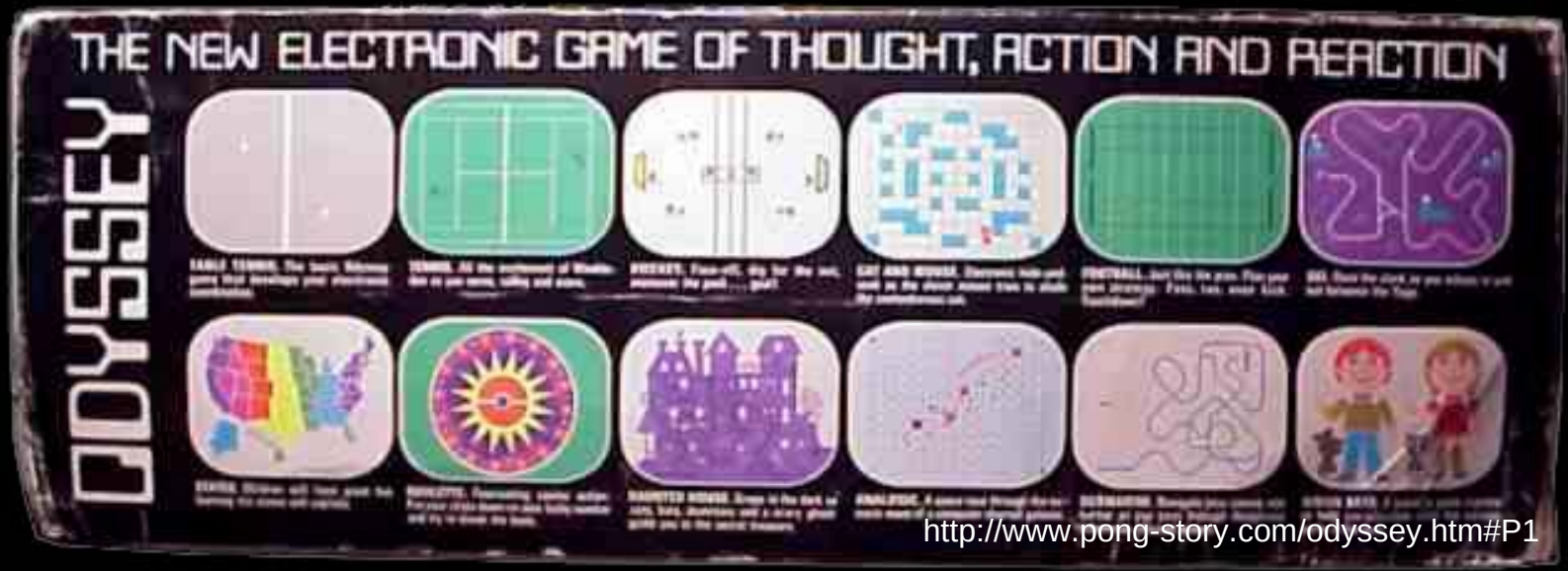


Moore's Law -

Shrink volume by 10^{11}

increase Power by 10^{11}

1972



"Ready or not, computers are coming to the people."

Stewart Brand, Rolling Stone December, 1972

XBOX 360

Ready or not, “SUPER COMPUTERS” are coming to the people!

USC ISI and Tactical Language Training

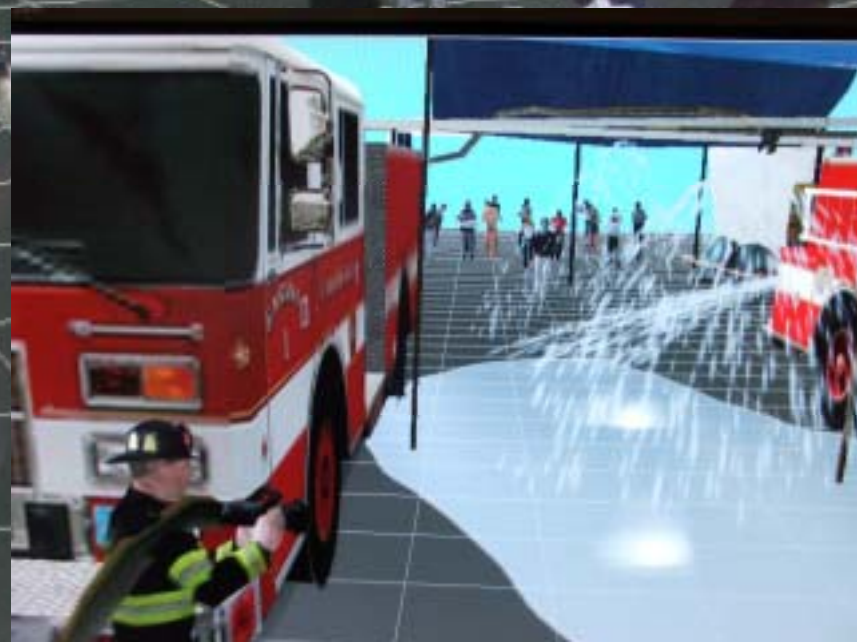
(ITSEC 2005)

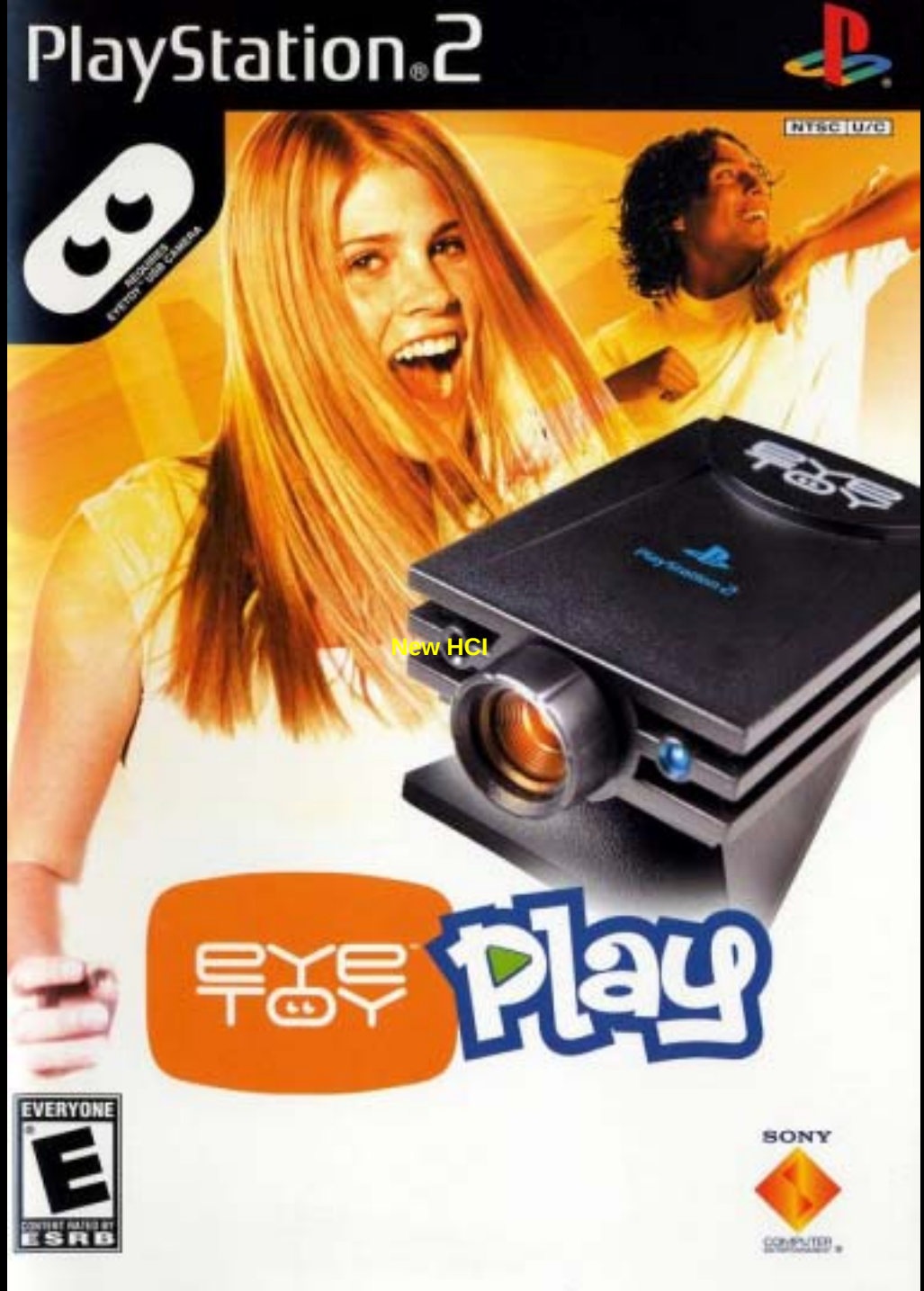
NETC – 24 Blue

(ITSEC 2005)

ADMS

(ITSEC 2005)




PlayStation 2
NTSC U/C
New HCI
EYE TOY
Play
EVERYONE
E
CONTENT RATED BY ESRB
SONY


3 HITS:
Hits 11


NOSE

the invisible train

Vienna University of Technology

Players operate track switches and adjusting the speed of virtual trains to prevent virtual trains from colliding. Researchers Daniel Wagner, Thomas Pintaric and Dieter Schmalstieg

Through mixing realities, research is expanding the potential of **embedded training in the field and in battle labs** to provide integrated training anytime, anywhere. **Advancements are being transferred across industries from business prototypes to hospitality training**. Integrated research in tracking, registration, rendering, display, and scenario delivery are expanding the possibilities of CONSTRUCTIVE simulation as well as after action review, and command and control visualizations.

Enhancing Military Operations in Urban Terrain (MOUT) with Mixed Reality and Theme Park Techniques

MIXED REALITY
& Training

University of Central Florida


6 x 1.0 mm
12 N·m
2 kgf·m, 8.7 lbf·ft)
B
A
Suddenly, it's clear.
See higher throughput in your service bays.
See your technicians become more productive.
See your customers drive home satisfied.
NOMAD®
EXPERT TECHNICIAN SYSTEM

Improved Target Acquisition System Trainer

First Person & Fidelity


WIRED
NEXTFEST


Time to Market

3

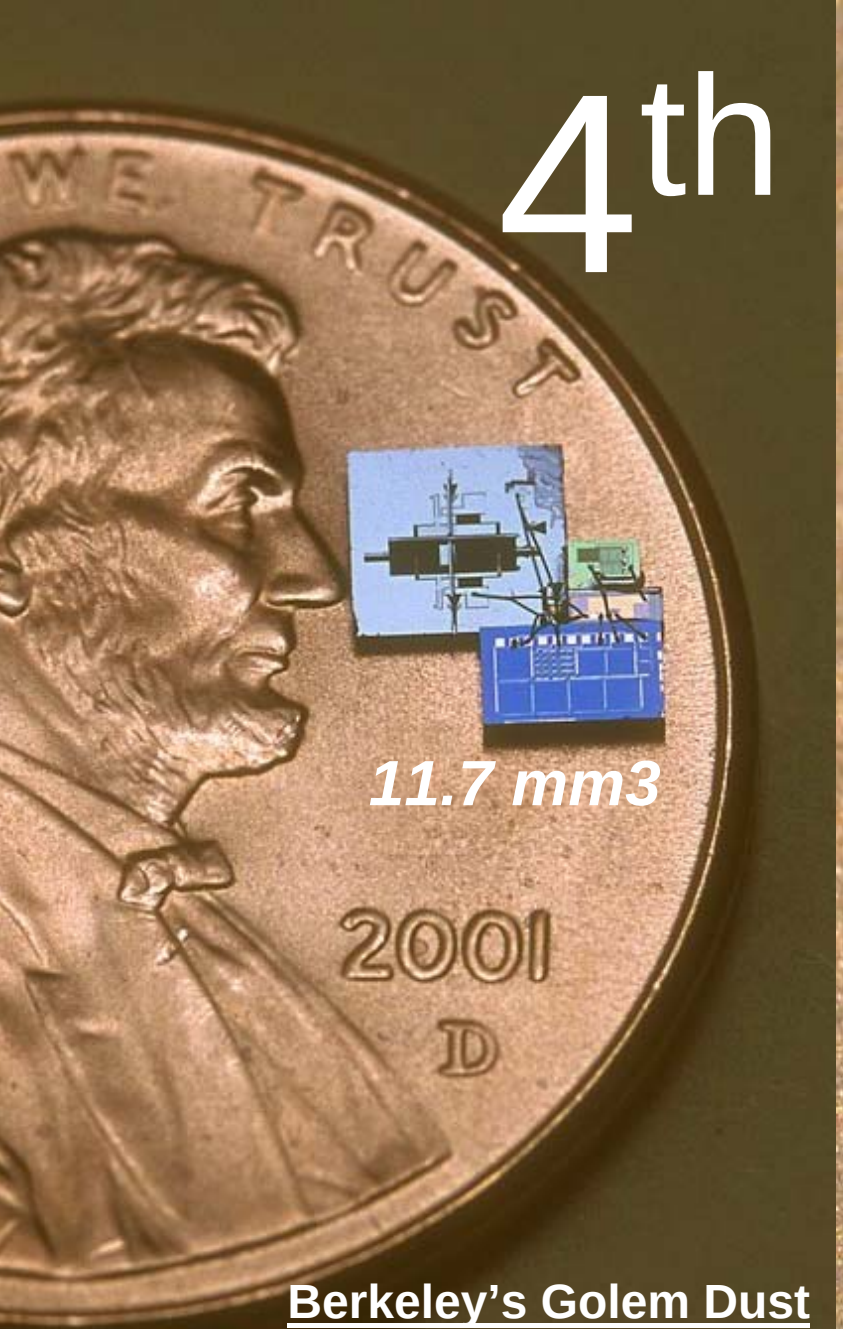
1st Gen → Mainframe

2nd Gen→ Mini

3rd Gen→ PC

4th Gen→ Sys on Chip

4th Gen



11.7 mm3

Berkeley's Golem Dust

11.7 mm3 total circumscribed volume
~4.8 mm3 total displaced volume

Berkeley's Deputy Dust

6.6 mm3 total circumscribed volume

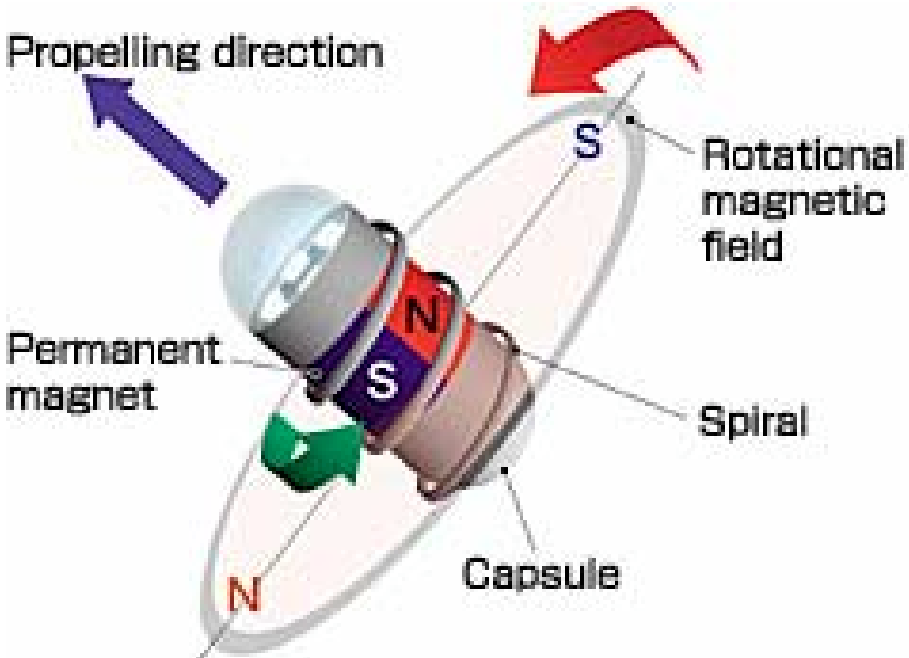
6.6 mm3

My daughter’s first computer at age 1 hour.

Time to Market

intel-research.net/berkeley/features/tiny_db.asp

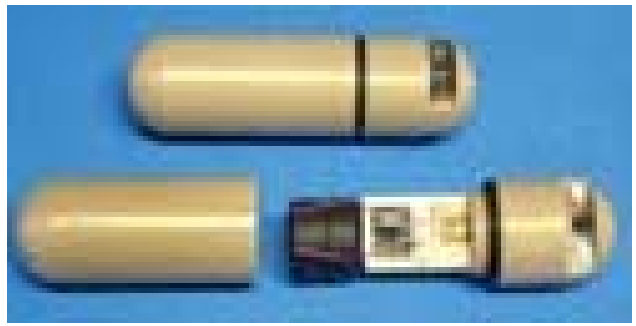
Capsule Endoscope



Examine the lining of the middle part of your gastrointestinal tract, which includes the three portions of the small intestine (duodenum, jejunum, ileum).

http://www.olympus.co.jp/en/news/2004b/nr041130capsle.cfm

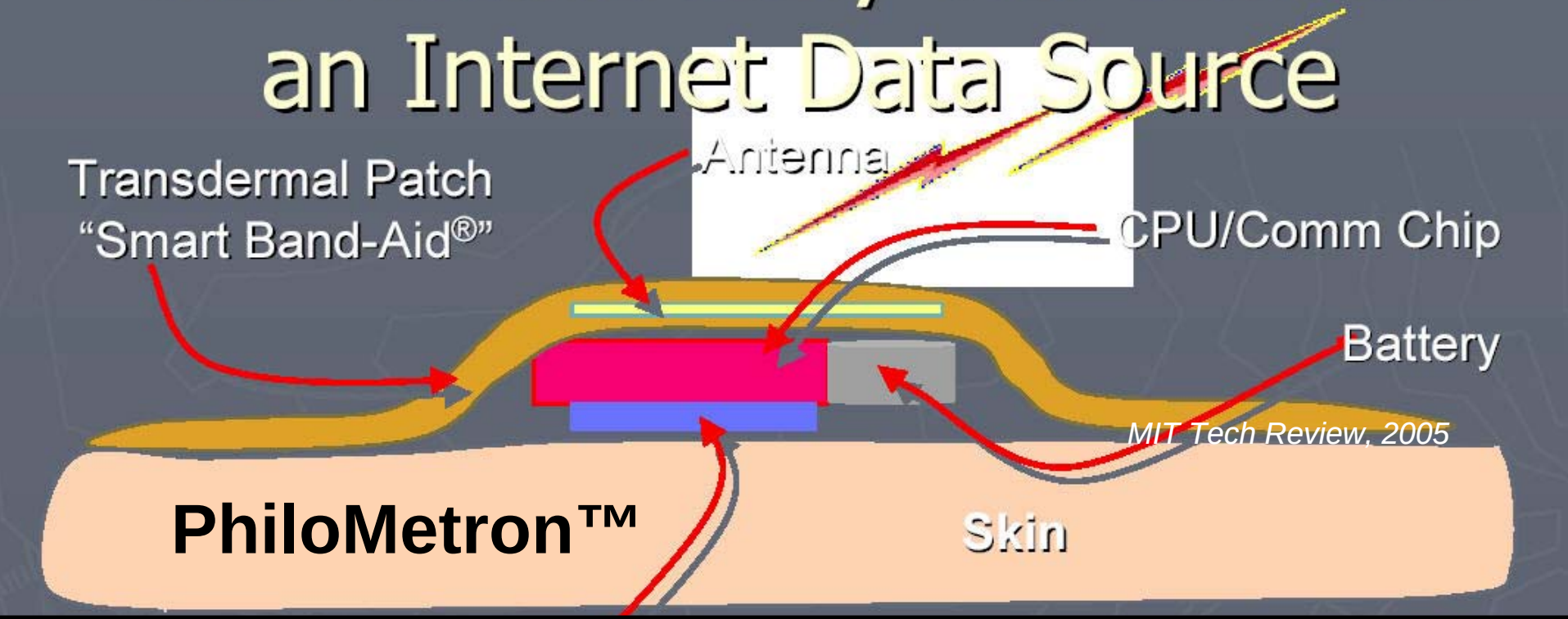
Lab-in-a-Pill



University of Glasgow

Integrates sensors, batteries, a control chip, and an RF transmitter in a 35mm-long housing.

The Human Body Will Become an Internet Data Source

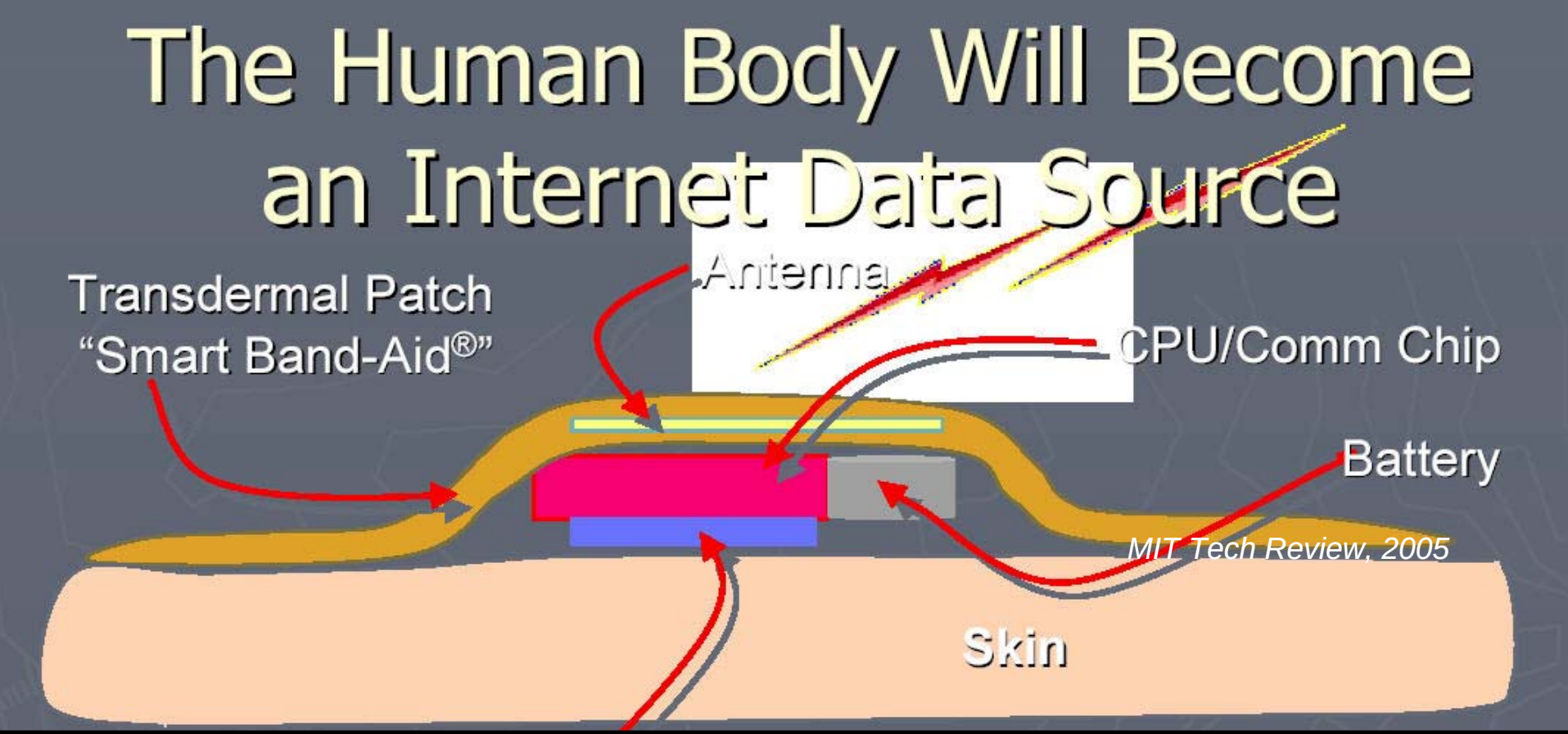


Sensors	Actuators
Physical	Physical
Chemical	Chemical
Biological	Biological

Machine Actors

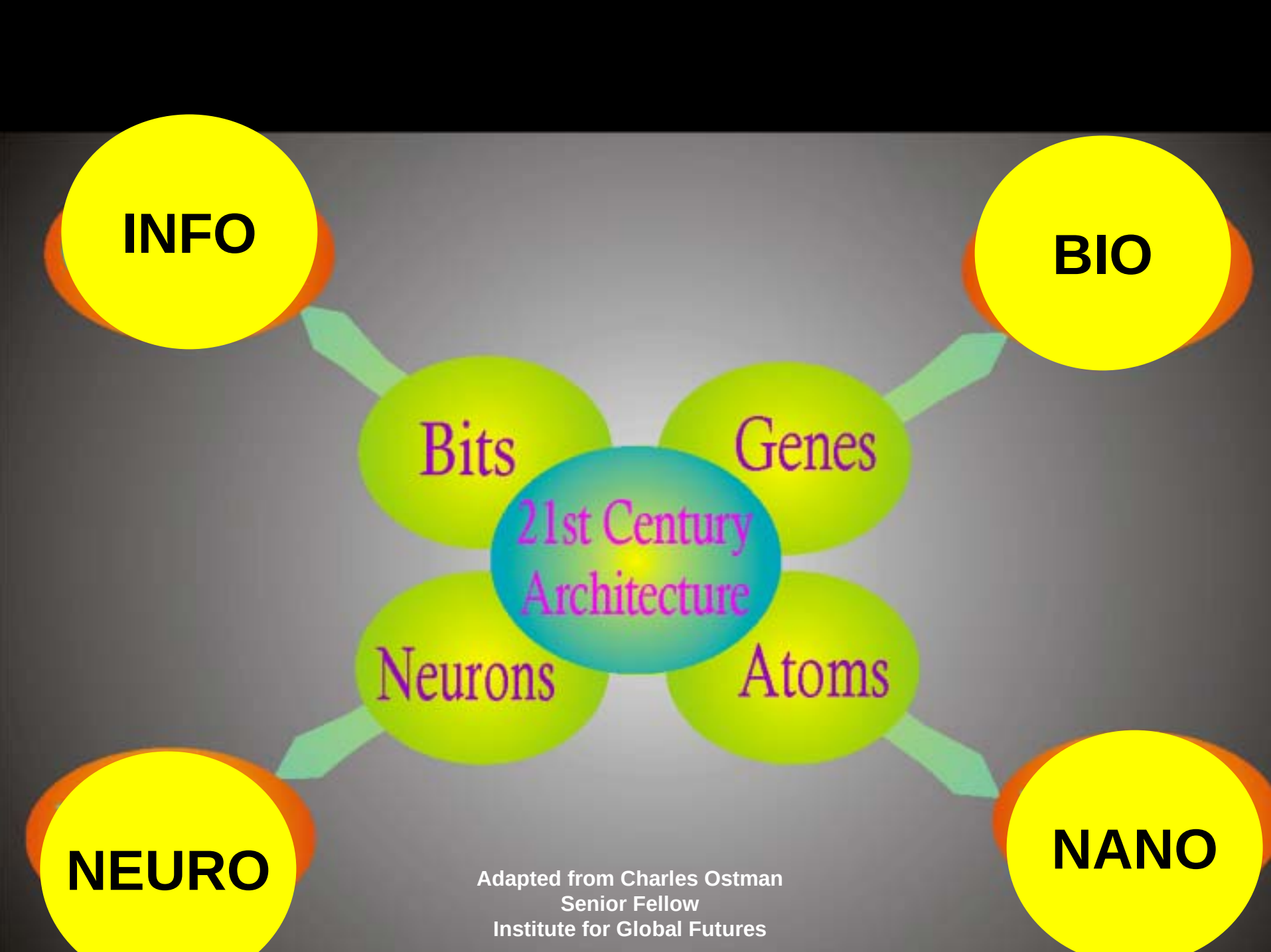
"Robots at same stage as 1978 PCs."

--Baylor University, Carbonara and Korpi



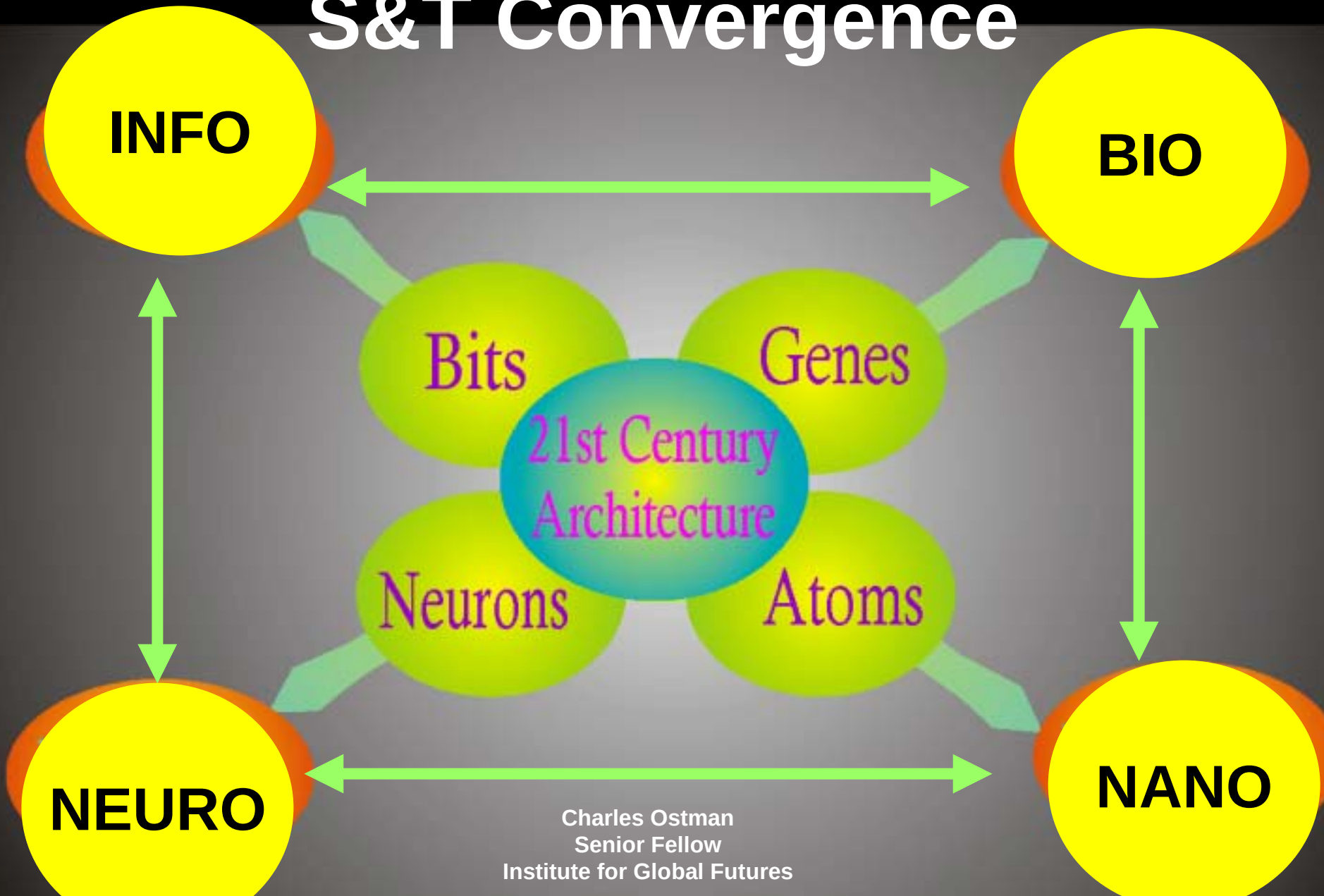
This is a ROBOT

What is fueling progress?



Adapted from Charles Ostman
Senior Fellow
Institute for Global Futures

S&T Convergence



Charles Ostman
Senior Fellow
Institute for Global Futures

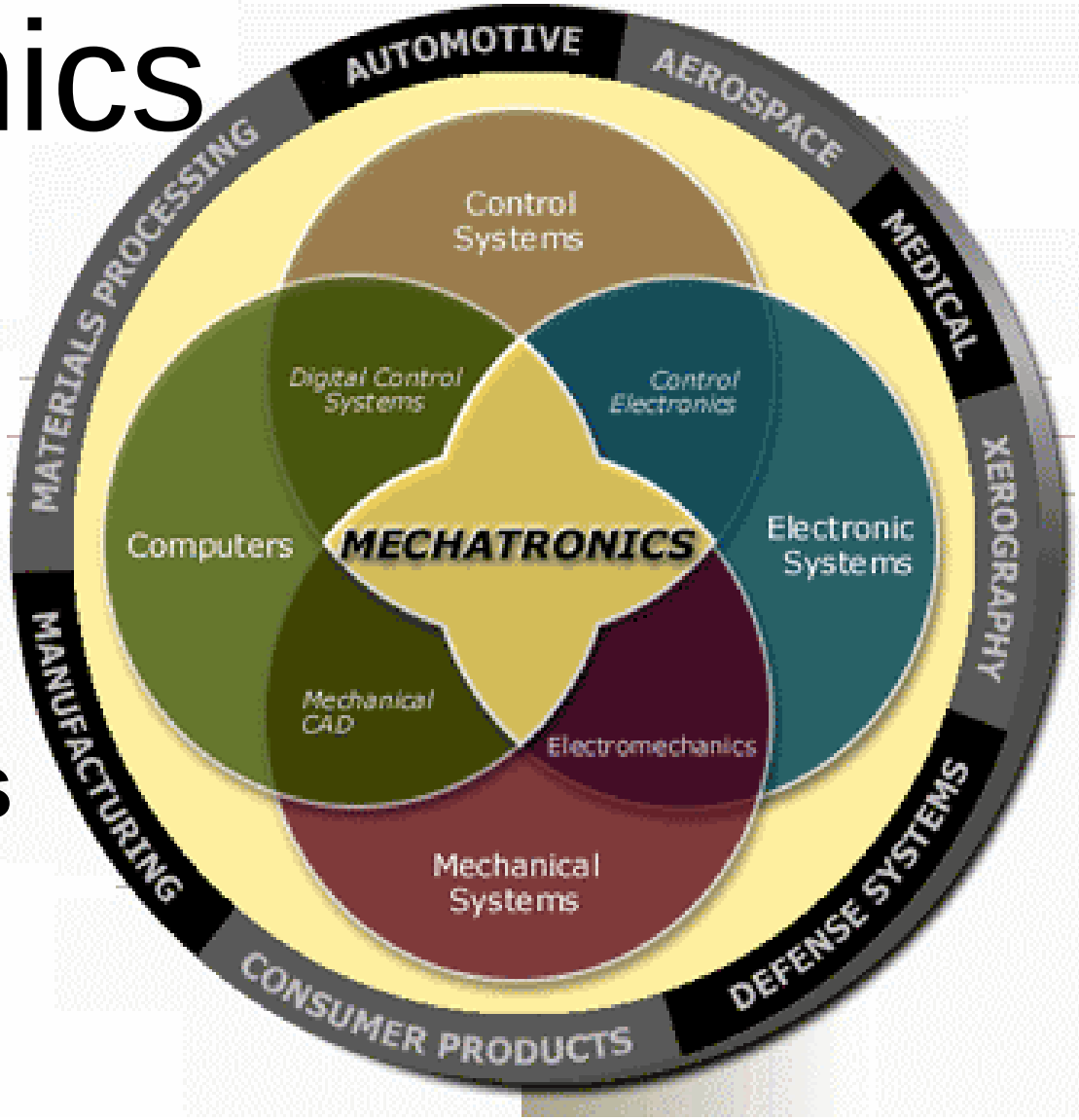
S&T Convergence refers to the synergistic combination of four major provinces of science and technology, each of which is currently progressing at a rapid rate:

(a) nanoscience and nanotechnology
(b) bioscience and genetic engineering
(c) info technology and communications
(d) cognitive science and neuroscience

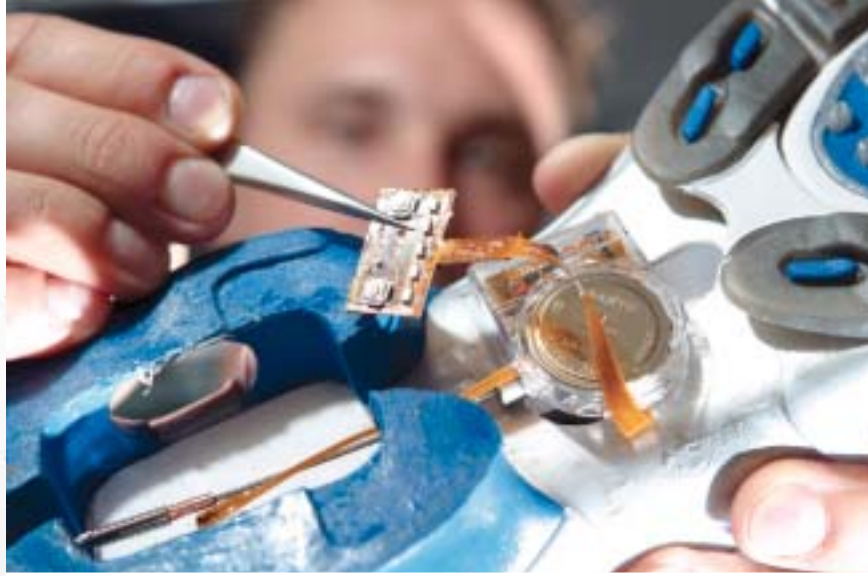
(Roco and Bainbridge, 2002)

Mechatronics

The synergistic combination of **mechanical engineering, electronics, control systems and computers.**



Mechanical, Aerospace, and Nuclear Engineering Departments at RPI



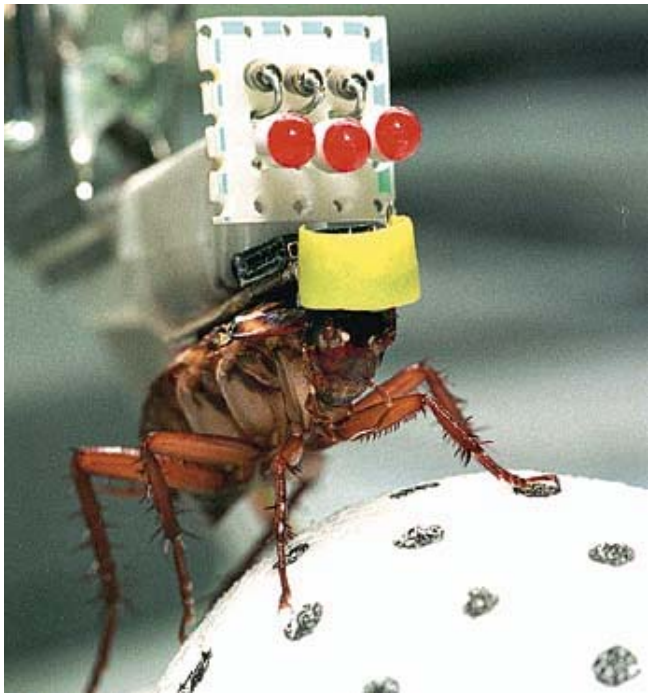
- **1,000th of a second sensor measures gap between heel and a magnet**
- **20-MHz microcontroller measures changes in compression**
- **Motor spins at 4000 rpm turns a screw loosens cable**
- **Environmentally and operator adaptive shoe sole**

THE FUTURE OF RUNNING IS HERE.

PUT ON A PAIR OF adidas_1 AND JUST FOUR STEPS FROM THE FRONT DOOR, YOUR SHOES HAVE ALREADY ANALYSED YOUR SPEED, WEIGHT AND THE TERRAIN UNDERFOOT AND HAVE DETERMINED THE PERFECT LEVEL OF CUSHIONING FOR YOUR NEEDS.

http://www.adidas.com/campaigns/adidas_1/content/downloads/adidas_1-wp_02_1280_1024.jpg
http://www.adidasprlookbook.com/adidas1/index.asp

Biotronics

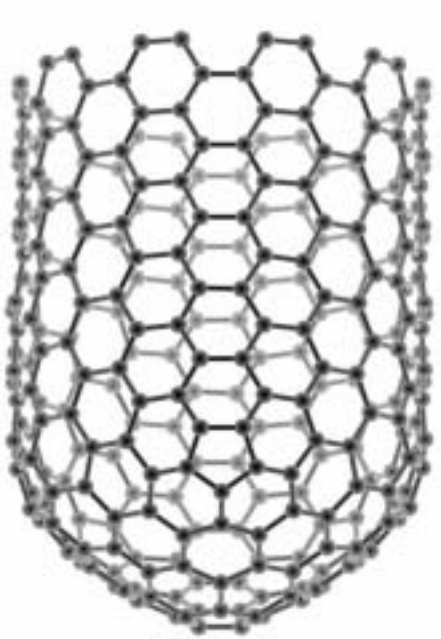


Micro-robotics team and biologists at **Tsukuba University**

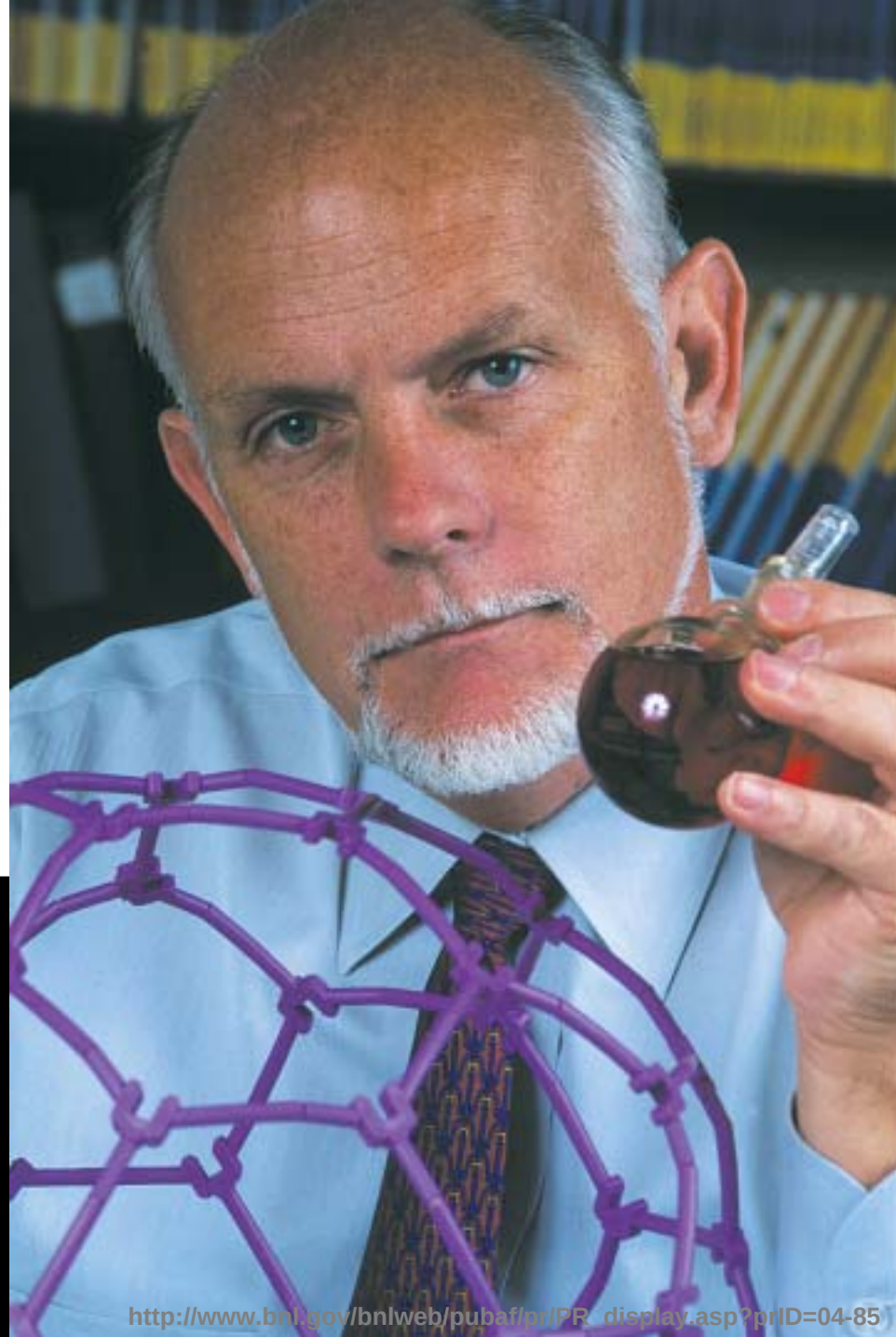
"**Go go gadget:** With a remote control sensor hotwired to its central nervous system, developments like the "roborat," created at **SUNY**'s Downstate Medical Center, herald the coming of the biotronic age.

Source: *The Guardian*
Date: 2 May 2002
State University of New York (**Suny**)

Nano

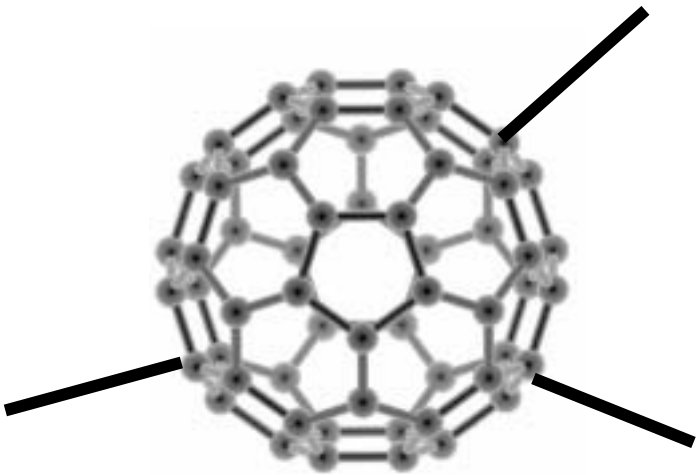


Richard E. Smalley, Robert Curl and Harold Kroto won 1996 Nobel Prize in Chemistry for the discovery of a structure of carbon atoms known as a “buckyball”.

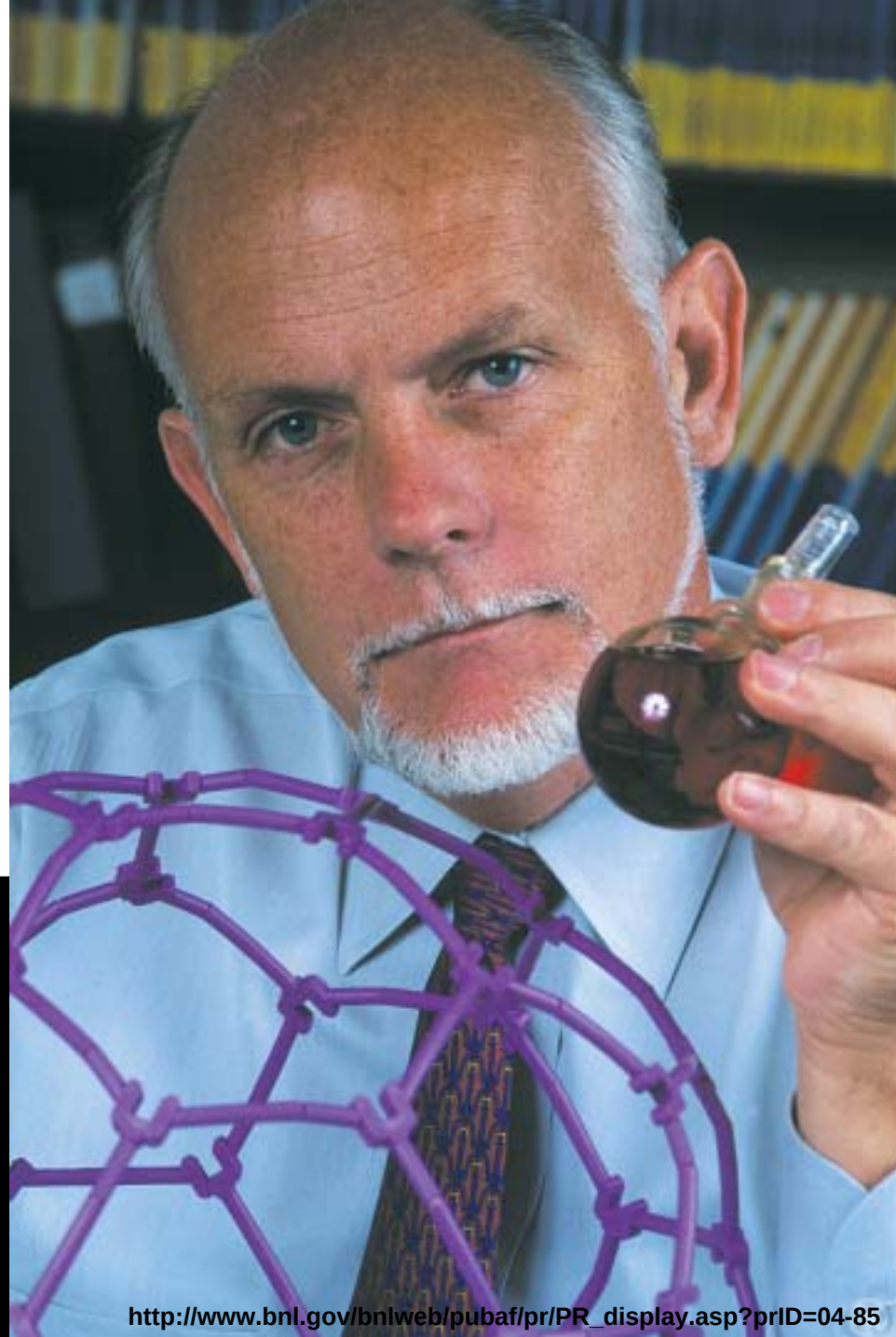


http://www.bnl.gov/bnlweb/pubaf/pr/PR_display.asp?prID=04-85

Nano-Bio



Pins can be added to a buckball to form an X, Y, Z coordinate system to DNA—a symmetry between fullerenes and DNA.

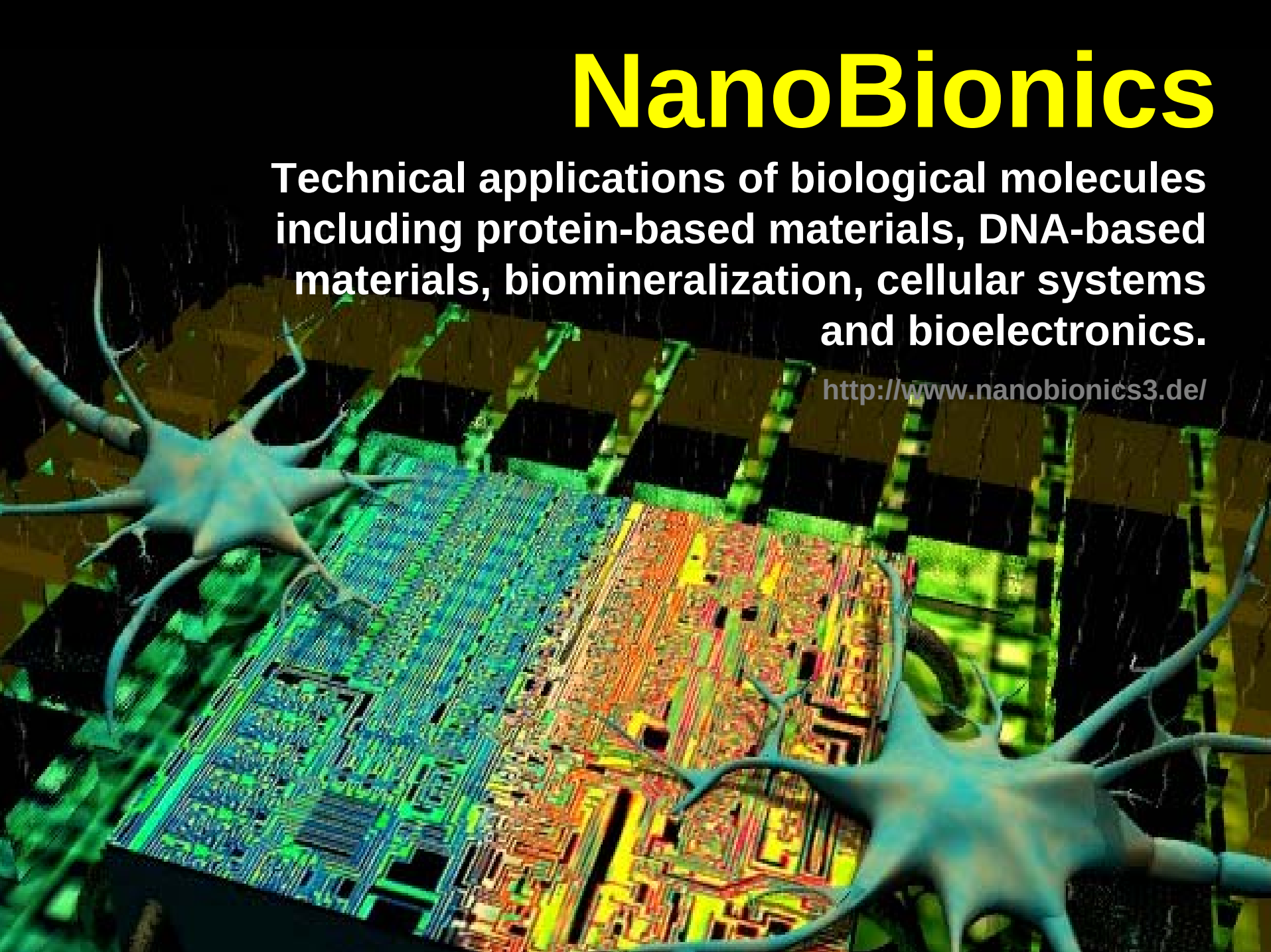


http://www.bnl.gov/bnlweb/pubaf/pr/PR_display.asp?prID=04-85

NanoBionics

Technical applications of biological molecules including protein-based materials, DNA-based materials, biomineralization, cellular systems and bioelectronics.

http://www.nanobionics3.de/



- S&T convergence is **transforming** technologies, industries, markets, economies and geographies of innovation.
- S&T Convergence has a high probability of providing a level of competitive advantage and wealth creation to nations, regions, industries and companies equal or greater than that which was provided in the past by the emergence of the automotive, aerospace and semiconductor industries.
- S&T convergence will even surpass the levels of economic and social prosperity created by these industries because convergence is now the platform for innovation in virtually all industries and all human endeavors.
- The organizations, cities, regions, states, and/or countries able to capture a controlling position within the realms of S&T will have an unprecedented competitive advantage on the world stage for many years.
- **Economic and security competitiveness are at stake!**

Preview

- How does S&T Convergence impact workforce education?
- What is TSTC doing about it?
- Who are the S&T Economic Development leaders?
- What K-12 interventions hold promise?
- What can industry do?

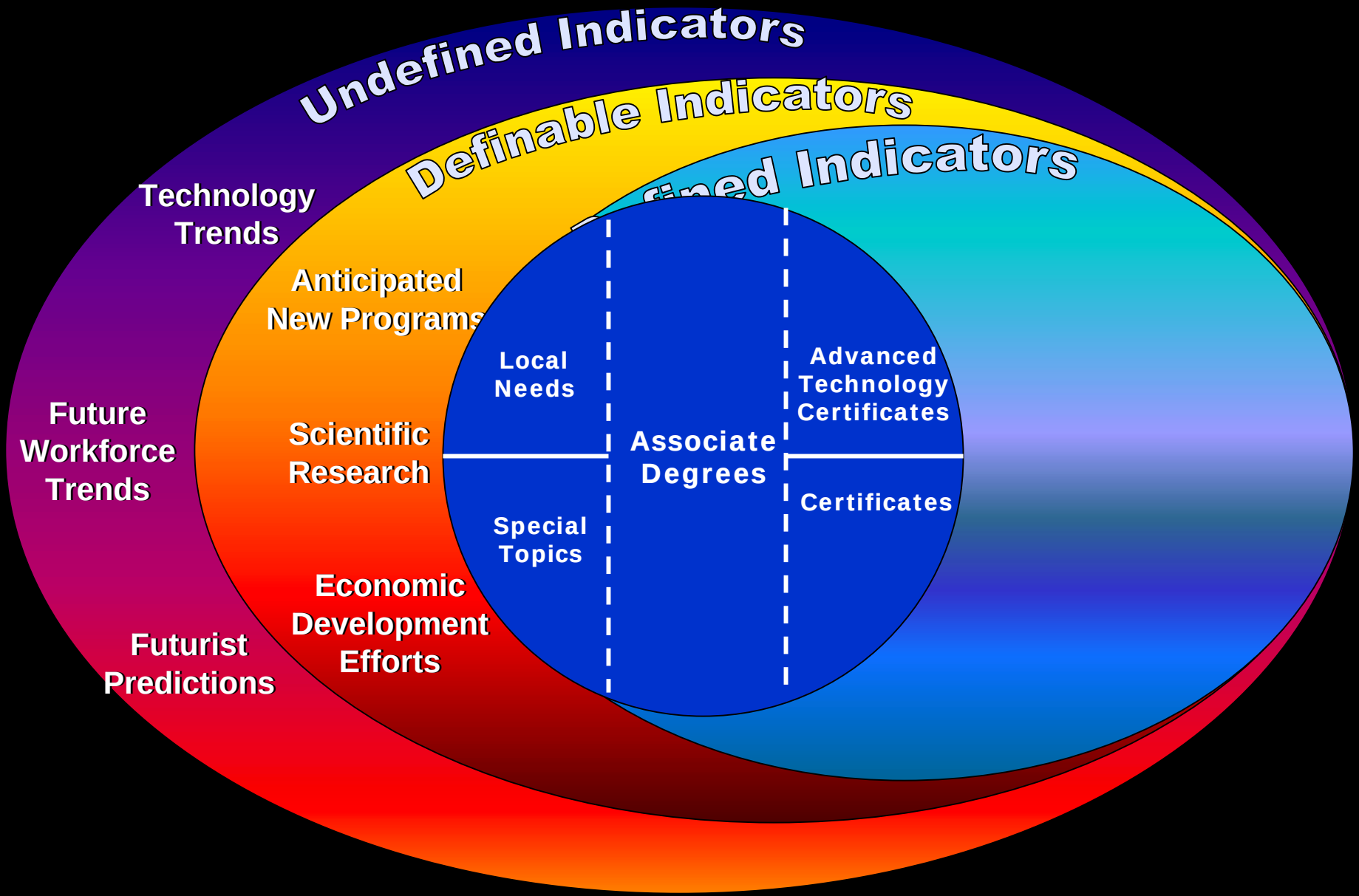
How does S&T convergence impact workforce education?

Council on Competitiveness: National Innovation Initiative

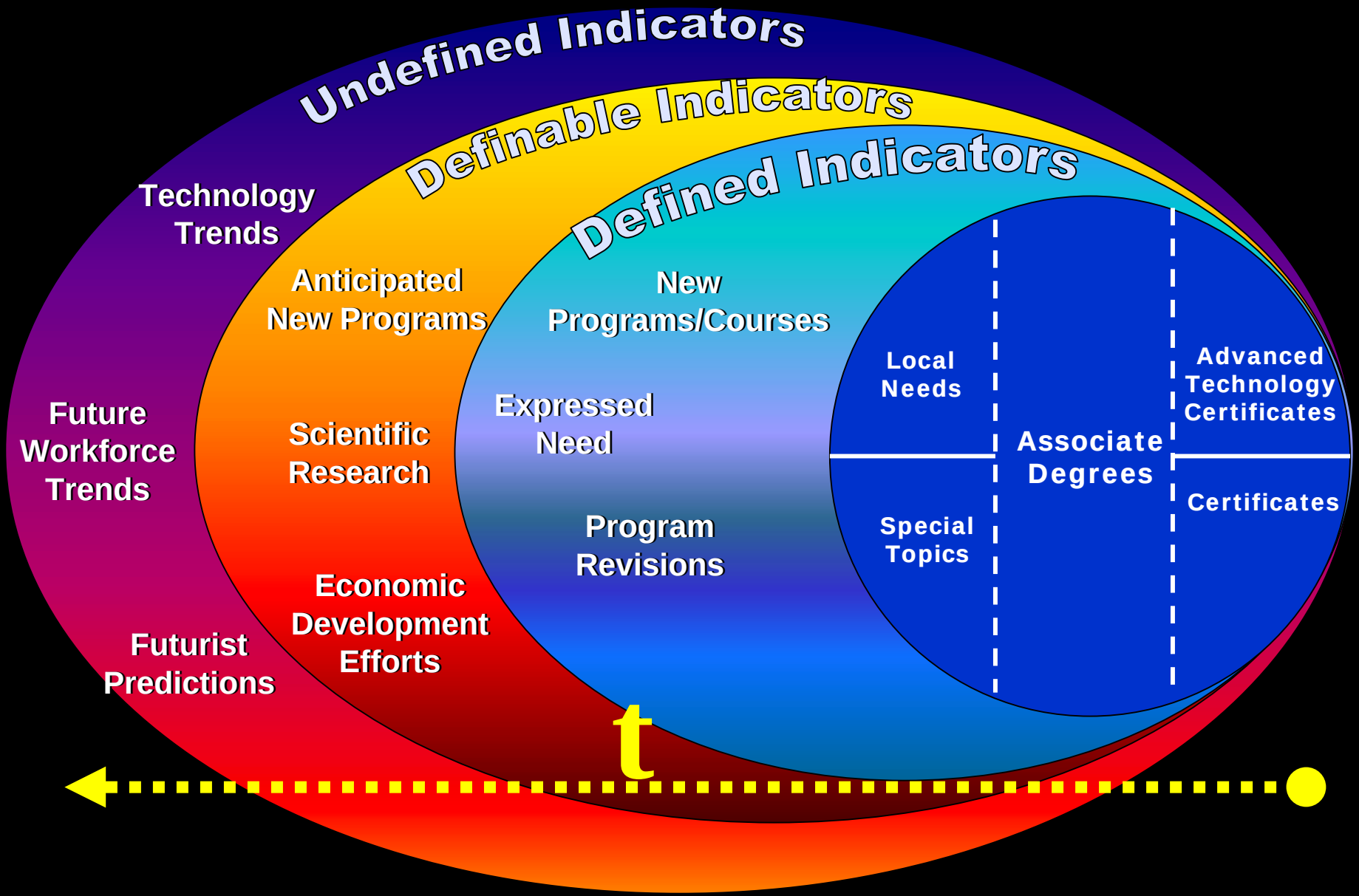
100 million jobs are going to be created in a lot of these cross-disciplinary fields

Samuel Palmisano (CEO, IBM): Business Week: 10.11.2004

Identifying New Technology Programs



Identifying New Technology Programs



“Innovate or Abdicate!”

“Over the next ten years, 26 of the top 30 fastest growing jobs will require some post-secondary education or training...The demand for skilled workers is outpacing supply, resulting in attractive, high-paying jobs going unfilled. ”

Emily Stover De Rocco
Assistant Secretary of Labor for Education and Training

What is TSTC doing about it?

Texas Cluster Initiative

- Advanced Technologies and Manufacturing
  - Nanotechnology and Materials
  - Micro-electromechanical Systems
  - Semiconductor Manufacturing
  - Automotive Manufacturing
- Aerospace and Defense
- Biotechnology and Life Sciences (Excluding Medical Services)
- Information and Computer Technology
  - Communications Equipment
  - Computing Equipment Semiconductors
  - Information Technology
- Petroleum Refining and Chemical Products
- Energy
  - Oil and Gas Production
  - Power Generation and Transmission
  - Manufactured Energy Systems

TSTC Emerging Technology Publications

Nanotechnology

Fuel Cells

Digital Games

Homeland Security

ADM, Hybrid, MEMS, Computer Forensics

Wireless: M2M

Texas Cluster Initiative

- Advanced Technologies and Manufacturing
  - Nanotechnology and Materials
  - Micro-electromechanical Systems
  - Semiconductor Manufacturing
  - Automotive Manufacturing
- Aerospace and Defense
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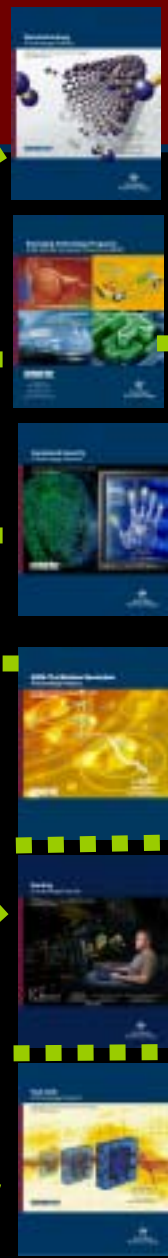


“Innovate or Abdicate!”

The number of jobs requiring technical training is growing at five times the rate of other occupations.

Innovate America, U.S. Council on Competitiveness

PET Criteria for Selecting Technology Topics

- Employment Opportunities
  - Total number of technicians that will be required statewide.
  - How long it will take for the projected jobs to materialize.
- Economic Impact
  - Anticipated economic impact for the State.
  - Potential to create wealth and prosperity.
- Curriculum Compatibility
  - Ease with which currently available curricula can be modified or expanded to provide appropriate KSAs.
  - Consider specialized equipment and faculty requirements.
- Career Attractiveness
  - Ability of a technology to provide challenging work and upward career mobility.

TSTC Emerging Tech Publication

Computer Forensics

Legal Issues

- Following Legal Procedures
- Preserving Integrity of Evidence
- Following Rules of Evidence
- Expert Interpretation

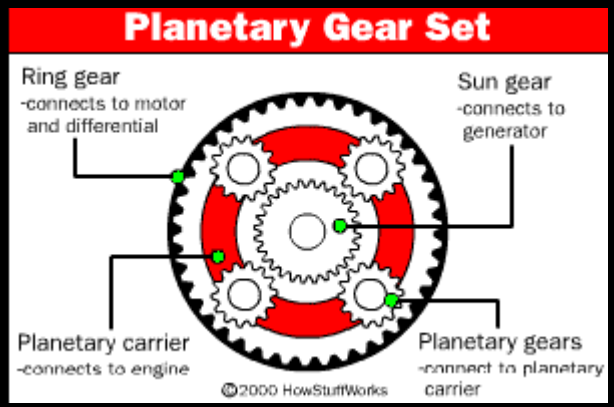
Applications

- Law Enforcement
- Corporate Sector
- Data Recovery
- Consulting/Private Investigations

Hybrid Vehicles

U.S. Hybrid Vehicle Releases

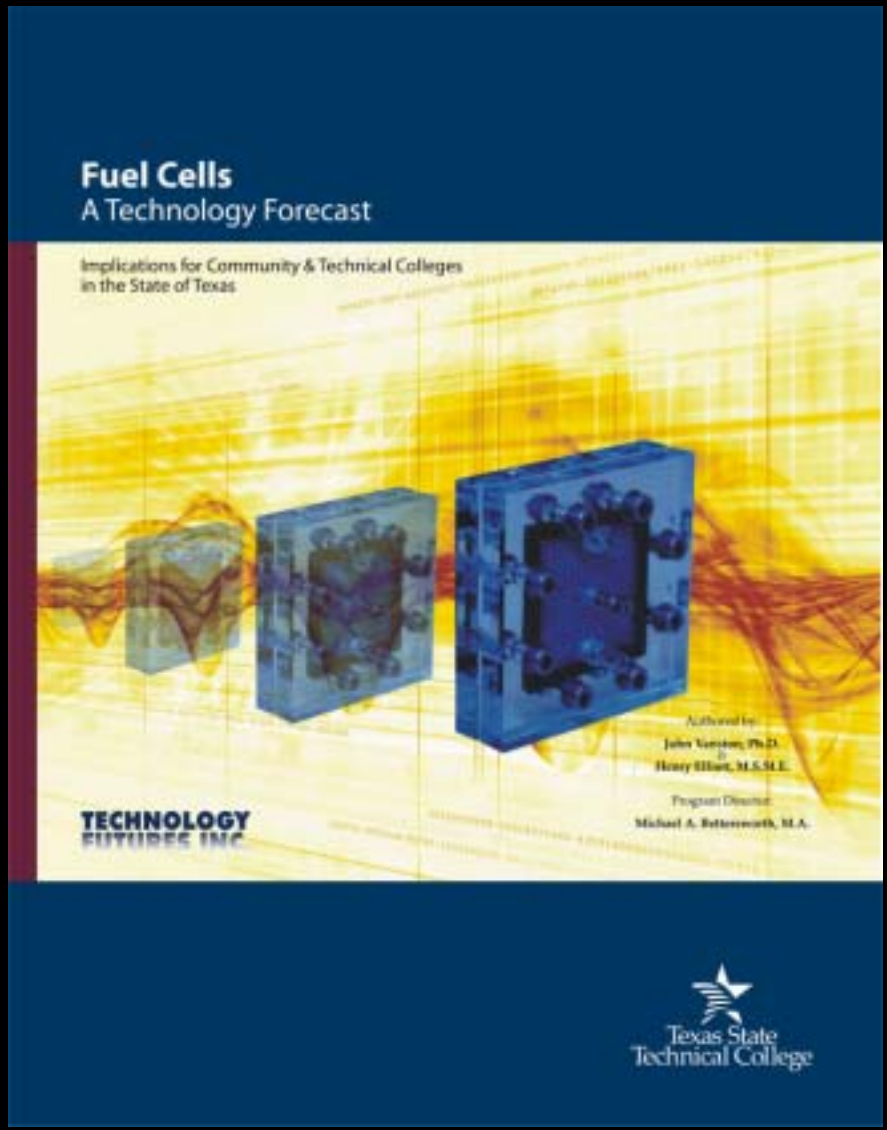
- Ford Escape SUV
- Chevy Silverado Pickup
- Lexus RX400 SUV
- Toyota Highlander
- Nissan Altima Sedan
- Saturn VUE SUV
- Chevy Malibu



Technologies

- Combustion Engine
- Transmission
- Electric Motor
- Generator
- Batteries
- High Voltage Circuitry
- Energy Management Sys

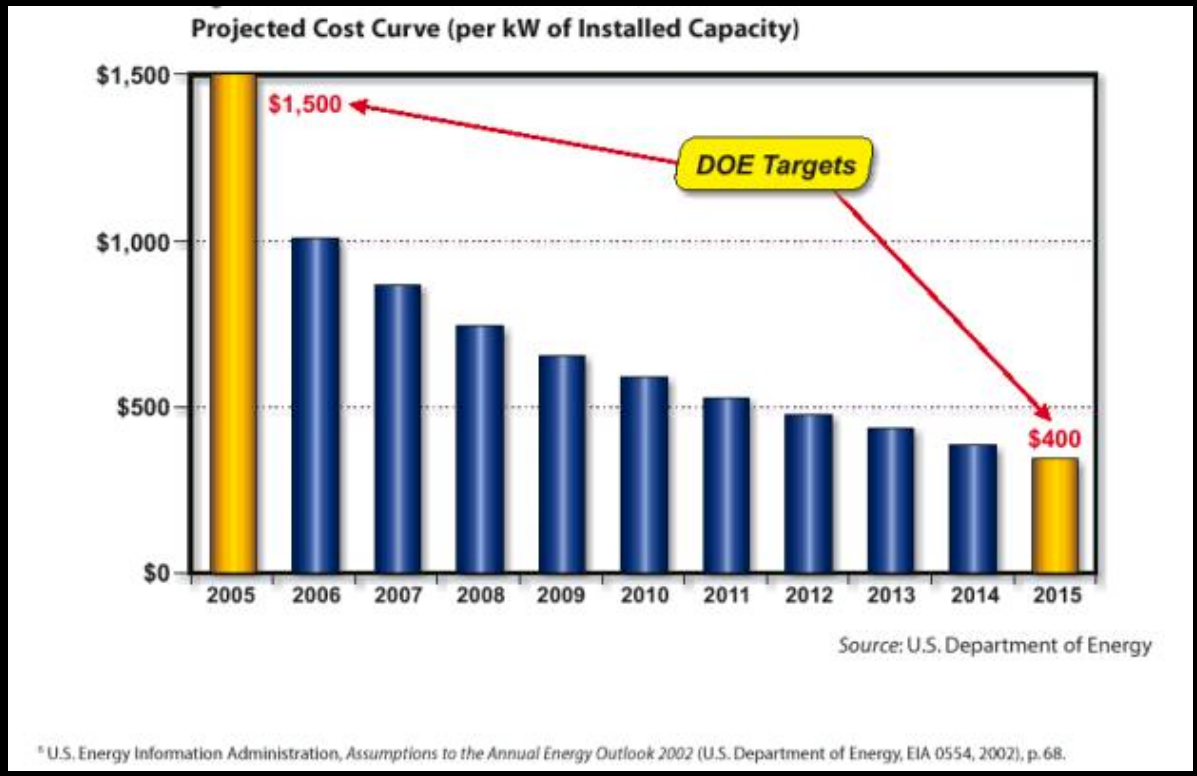
TSTC Emerging Tech Publication



Fuel Cells

Fuel Cell Applications

- Stationary
- Mobile
- Portable



[5] U.S. Energy Information Administration, *Assumptions to the Annual Energy Outlook 2002* (U.S. Department of Energy, EIA 0554, 2002), p. 68.

2005 Texas Fuel Cell Curriculum Members

- Alamo Community College District
- Dallas County Community College District
- Del Mar College
- Houston Community College District
- Lamar Institute of Technology
- Lee College
- Midland Community College
- North Harris Montgomery Community College District
- Southwest Texas Junior College
- St. Phillips College
- Tarrant County Community College District
- Texas State Technical College Harlingen
- Texas State Technical College Waco
- Wharton County Junior College


Fuel Cell Technology Instructional Website - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://www.waco.tstc.edu/ecr/ecr_fuelcell/dept.php
Texas State Technical College Waco
Electrical/Computerized Control Systems & Robotics
Associate of Applied Science Degree
» Request Information
Welcome | Programs | Academics | Admissions | Financial Aid | Student Email | WebAdvisor | Jobs
Agriculture | IT & Telcom | Engineering & Manufacturing | Health & Sciences | Business, Commerce & Service | Transportation & Aviation
Fuel Cell Technology
» Welcome Letter
» Career Outlook
» Faculty & Staff
» Facilities
» Job Placement
» Advisory Committee
» Cost Sheet
» Instructional Website
AAS Degree
» Fuel Cell Technology
» Other ECR Degrees
SEARCH
Fuel Cell Technology
Instructional Website
Fuel Cell DACUM
Fuel Cell Curriculum
FCEL 1304 - Mechanical Aspects of Fuel Cell Systems
FCEL 1304 - Syllabus
FCEL 1304 - Learning Activity Plan
FCEL 1304 - Assessment Plan
FCEL 1305 - Introduction to Fuel Cells & Alternative/Renewable Energy
FCEL 1305 - Syllabus
FCEL 1305 - Learning Activity Plan
FCEL 1305 - Assessment Plan
FCEL 2301 - Fuel Cell Principles, Components & Controls
FCEL 2301 - Syllabus
ECR Office:
voice: 254-867-4839
fax: 254-867-3150
Department Chair:
Sid Bolfing, Dept. Co-Chair
voice: 254-867-3206
sidney.bolfing@tstc.edu
Mailing Address:
3801 Campus Drive
Waco, TX 76705
Location:
The ECR Office is located in the Electronics Office Center/Library.
Office Hours:
M - F 8:00 am - 5:00 pm

TSTC Emerging Tech Publication


Airway
Circulation
Breathing
Patient Injuries: Scalp wound with blood loss of 500cc
Map
Chart
Msg
H
R
C
L
A
R
L
Bleeding
GCS
Triage
Move Patient
Street, Barbara
0:35:32
Doug Whatley
Breakaway Games
AMBULANCE
10000
Selected:
Patient
Source: Jim Brazell, Ventureramp


Campus
Faculty
Students
Courses
Performance
Finance
Score
$7,345
53
83
SEP 26
FALL 04
MENU
MORE REPORTS
PLAYER UNIVERSITY
Business
Police Station
Affairs Office
Residence Hall
Technology Services
Physics
Gender/Ethnic Studies
Parking Structure
Psychology
Surplus or deficit
$7,345
Environmental
Prestige 39%
Selectivity 12%
Projected reserves
$36,021
Law
Total students 5,700
Total faculty 271
Net tuition $78,153
Research $113,736
Faculty morale 47%
Student morale 15%
POLICE STATION
LOG
Sep Yr. 4
Department: I'm pleased with academic standing in the Law Department. I hope you can do even better in the future.
Message from a trustee: I'm pleased with institutional prestige. I hope you can do even better in the future.

Source: Jim Brazell, Ventureramp

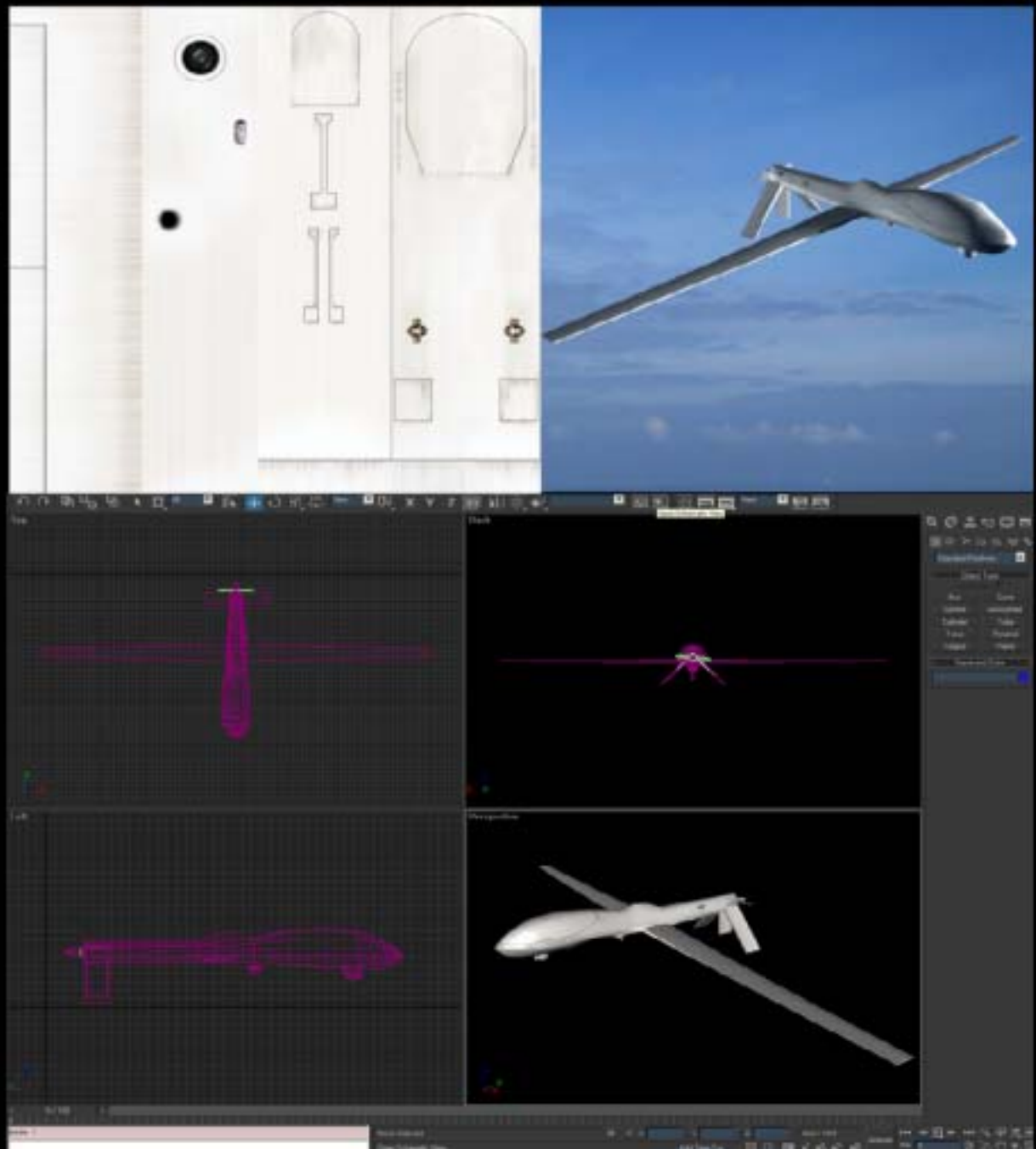
MILITARY

RQ-1 Predator UAV

modeled by Ethan Mckinnon

textured by Ethan Mckinnon

999 tri polys



Ethan McKinnon
Xarism and Northrop
San Antonio, TX

From: Jim Brazell, Ventureramp

Global Gaming Market Projections

	2001	2006	% CHANGE
Console Software	$9.64B	**$18.34B**	**90**
Console Hardware	$9.19B	$14.29B	55
PC Software	$7.12B	$8.33B	17
Handheld Software	$2.89B	$3.76B	30
Handheld Hardware	$2.73B	$3.4B	25
Rental	$3.14B	$4.14B	32
Online	$0.57B	**$5.65B**	**891**
Interactive TV	$0.08B	**$6.15B**	**7,584**
Mobile	$0.76B	**$11.01B**	**1,354**
Arcades	$13.86B	$10.66B	**-23**
TOTAL	$49.99B	**$85.71B**	**71%**

Source: IGDA

Sample of Texas Gaming CTC Programs

TSTC Waco

- AAS Graphics, Gaming and Simulation Programming
- ATC 3-D Virtual Reality

San Jacinto Community College

- CERT1 Multimedia Game Programming

TSTC Harlingen

- AAS Game and Simulation Programming

Collin County Community College

- CERT1 Gaming Graphics and Animation

Hill College

- AAS Programming/Game Development
- CERT1 Programming/Game Development

Houston Community College Southwest

- AAS & CERT Digital Gaming & Simulation for Artists
- AAS & CERT Digital Gaming & Simulation for Programmers

Graphics, Gaming & Simulation Specialization
» Welcome Letter
» Career Outlook
» Faculty & Staff
» Facilities
» Job Placement
» Advisory Committee
» Distance Learning
» Instructional Website
» Cost Sheet
AAS Degree
» Graphics, Gaming & Simulation Specialization
» Other CST Degrees
SEARCH

Graphics, Gaming & Simulation Specialization

..A specialization in Computer Science Technology

Upon successfully completing the required course-work, TSTC will award you an Associate of Applied Science degree in Computer Science Technology. Full-time, academically prepared students can complete the program in approximately two years.

In this specialization, students learn to design and create systems and programs to meet the graphics and simulation programming needs of business and industry. Upon successful completion of the requirements, TSTC will award you an Associate of Applied Science degree. As a graduate, you can seek positions in the industry as an entry-level programmer with knowledge and skills applicable to computer graphics, gaming and simulation.

Computer Science Technology
Graphics, Gaming and Simulation Programming - AAS
Total Credits: 72

First Semester			Credits
LAWT	1270	Laws of Cyberspace & Ethical Issues	2
ITSE	1407	Intro to C++ Programming	4
ITSE	1379	Intro to Animation Programming	3
ITSE	2337	Assembler Language Programming	3
			Total 12

Second Semester			Credits
MATH	2318	Linear Algebra	3
ITSE	1370	Intro to Graphics Programming	3
ITSE	2331	Advanced C++ Programming	3
ITSE	2372	Numerical Methods in Graphics Programming	3
			Total 12

Third Semester Credits

3-D Virtual Reality
» Welcome Letter
» Career Outlook
» Faculty & Staff
» Facilities
» Job Placement
» Advisory Committee
» Cost Sheet
Certificate
» 3-D Virtual Reality
» Other DMD Degrees
SEARCH

3D Virtual Reality

... A specialization in Digital Media Design

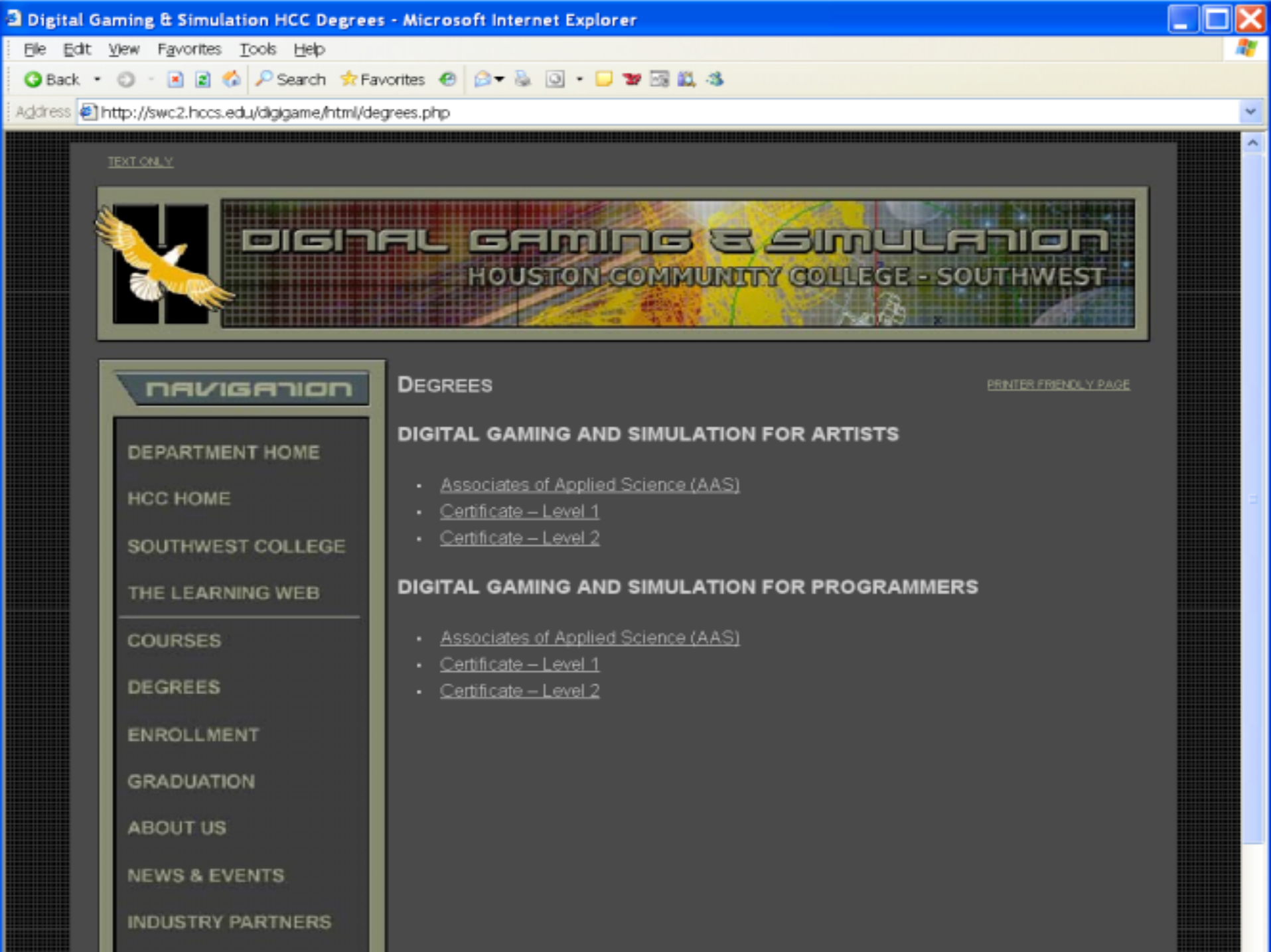
To enroll in the Virtual Reality Advanced certificate program, students must have an approved associate's degree or higher from an accredited institution and have completed 3-D prerequisite courses in the DMD department.

Digital Media Design
3-D Virtual Reality
Total Credits: 35

First Semester			Credits
ARTT	1201	Conceptual Figure Drawing	2
GRPH	1370	Digital Texture Painting	3
ARTC	1370	3-D Mechanical Animation	3
ARTC	1371	3-D Low Polygon Modeling	3
LAWT	1270	Laws of Cyberspace and Ethical Issues	2
			Total 13

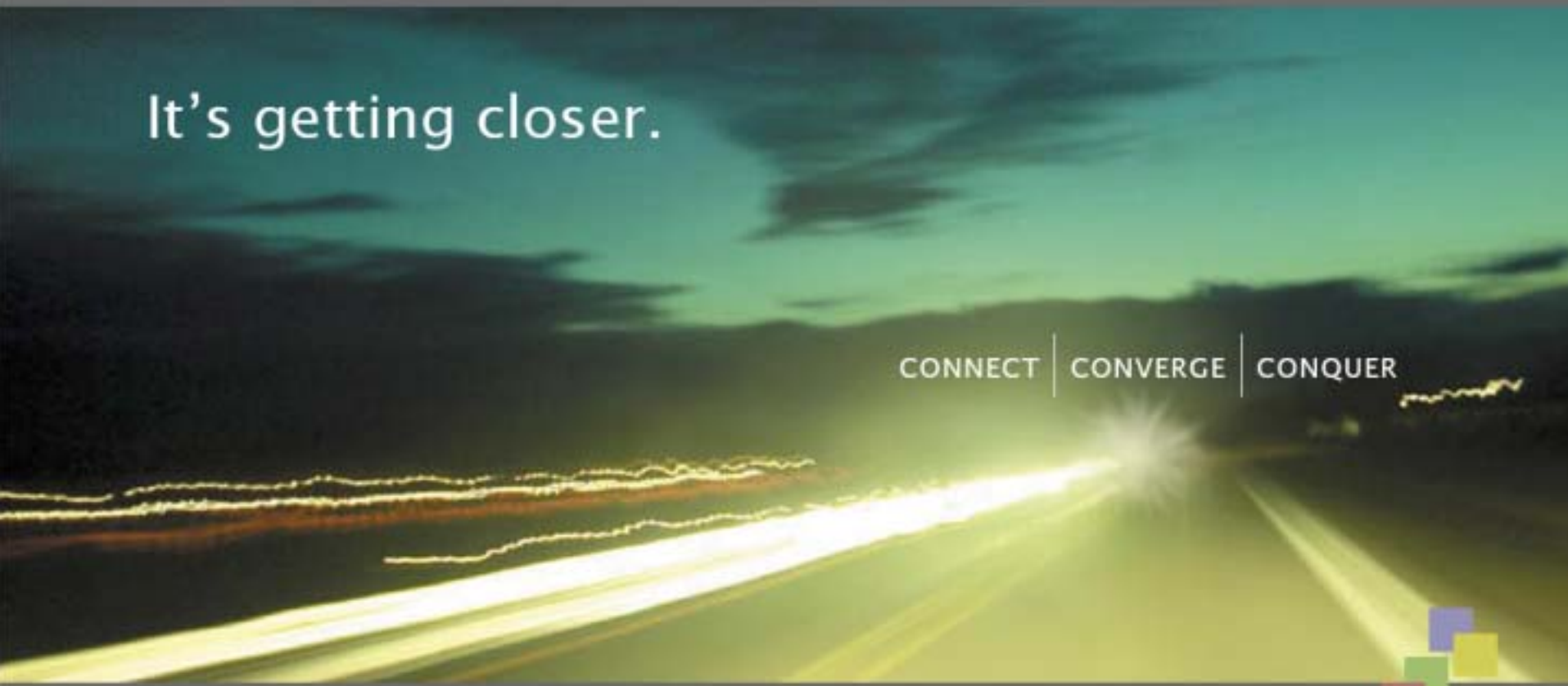
Second Semester			Credits
ARTT	1251	Interpretive Figure Drawing	2
ARTC	1372	Digital Compositing I	3
ARTC	1373	3-D Character Animation	3
IMED	1370	VR Authoring I	3
ARTC	2331	Illustration Concepts	3
			Total 14

Third Semester			Credits
ARTC	2470	Digital Compositing II	4
IMED	2470	VR Authoring II	4
			Total 8


Digital Gaming & Simulation HCC Degrees - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://swc2.hccs.edu/digigame/html/degrees.php
TEXT ONLY
DIGITAL GAMING & SIMULATION
HOUSTON COMMUNITY COLLEGE - SOUTHWEST
NAVIGATION
DEPARTMENT HOME
HCC HOME
SOUTHWEST COLLEGE
THE LEARNING WEB
COURSES
DEGREES
ENROLLMENT
GRADUATION
ABOUT US
NEWS & EVENTS
INDUSTRY PARTNERS
DEGREES
PRINTER FRIENDLY PAGE
DIGITAL GAMING AND SIMULATION FOR ARTISTS
Associates of Applied Science (AAS)
Certificate – Level 1
Certificate – Level 2
DIGITAL GAMING AND SIMULATION FOR PROGRAMMERS
Associates of Applied Science (AAS)
Certificate – Level 1
Certificate – Level 2

www.forecasting.tstc.edu

Who are the S&T economic development leaders?



September 22, 2005 Conference

LBJ Student Center

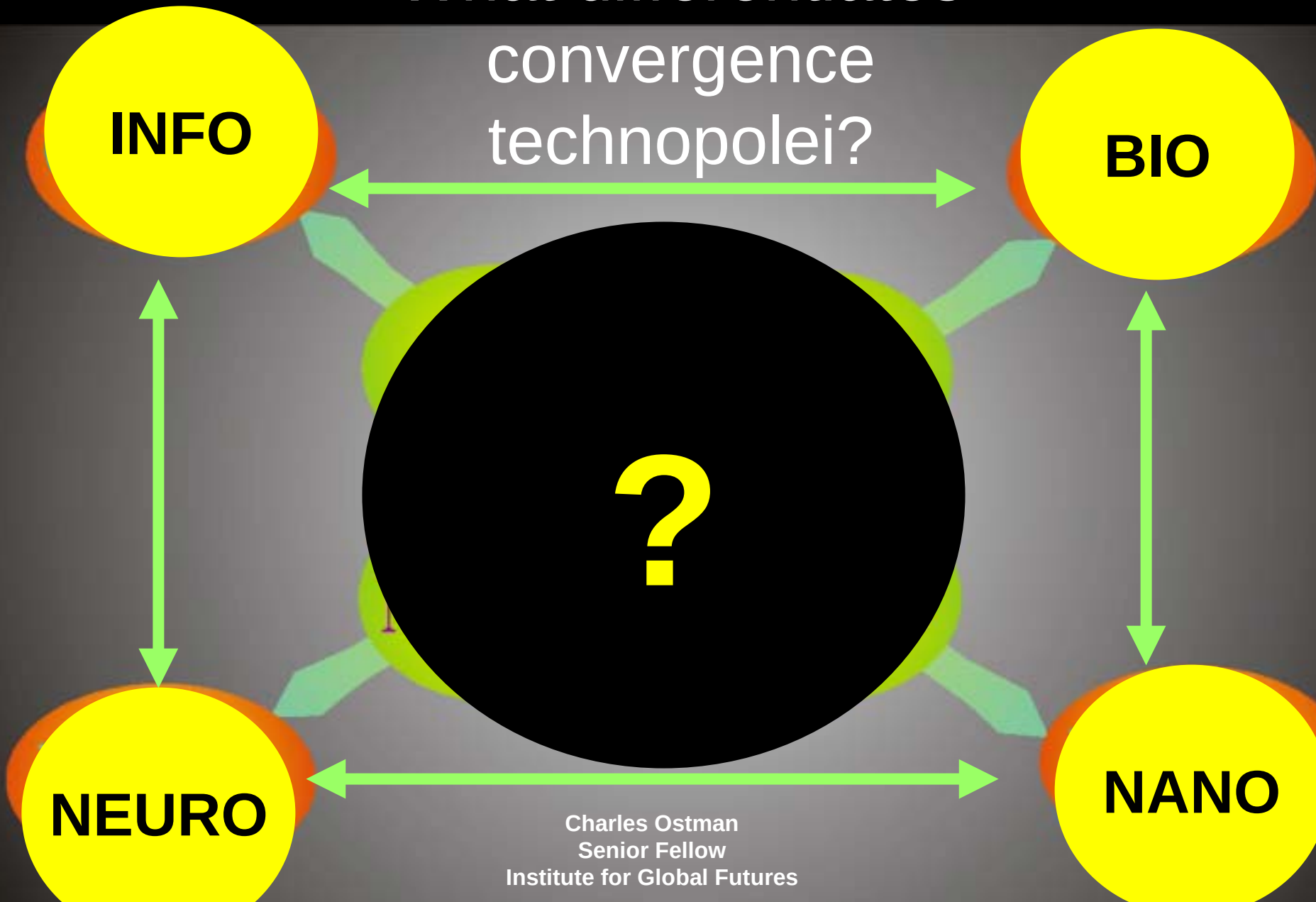
Texas State University

San Marcos

digital **convergence** intitiative

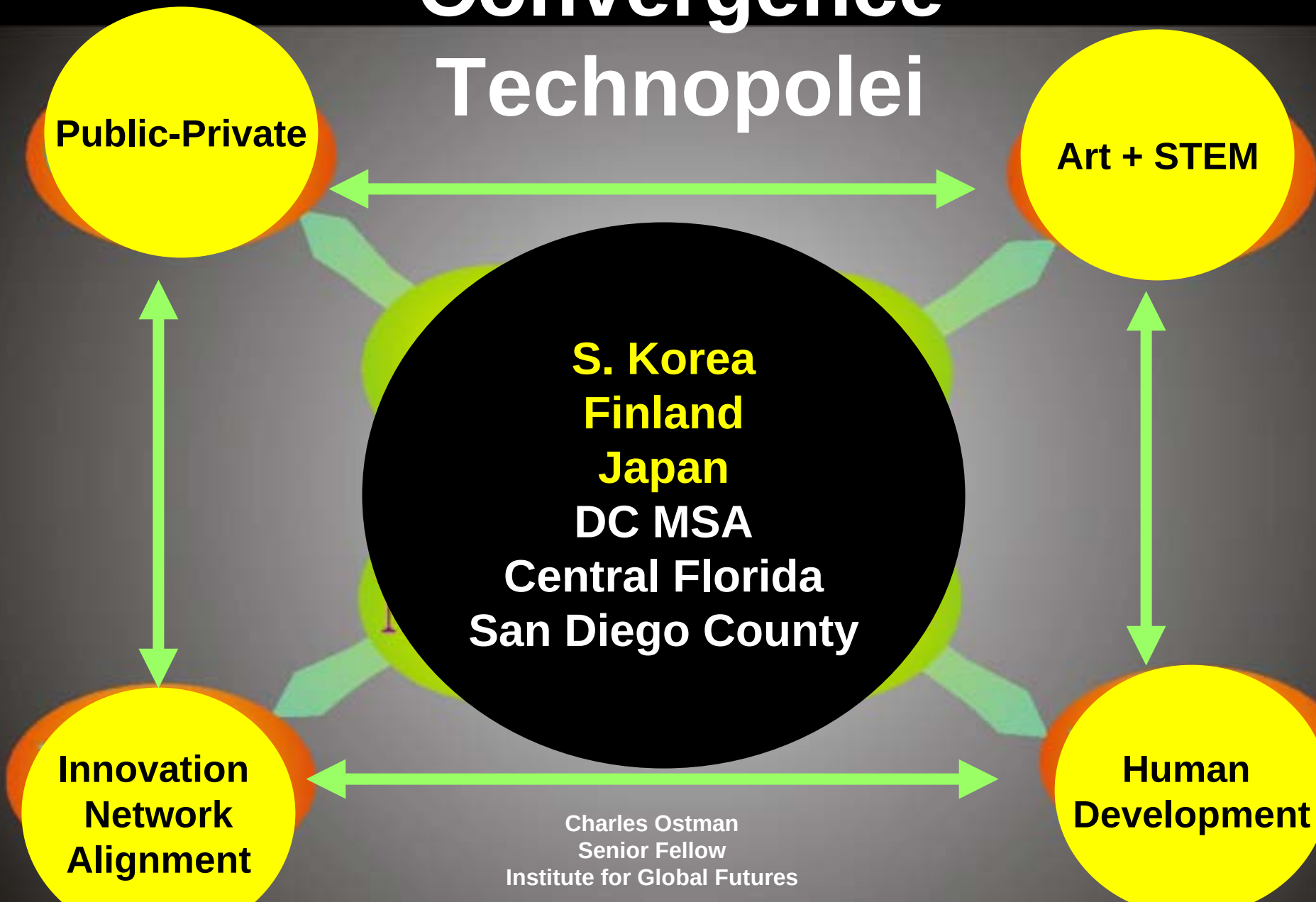
CENTRAL TEXAS

What differentiates convergence technopolei?



Charles Ostman
Senior Fellow
Institute for Global Futures

Convergence Technopolei



Charles Ostman
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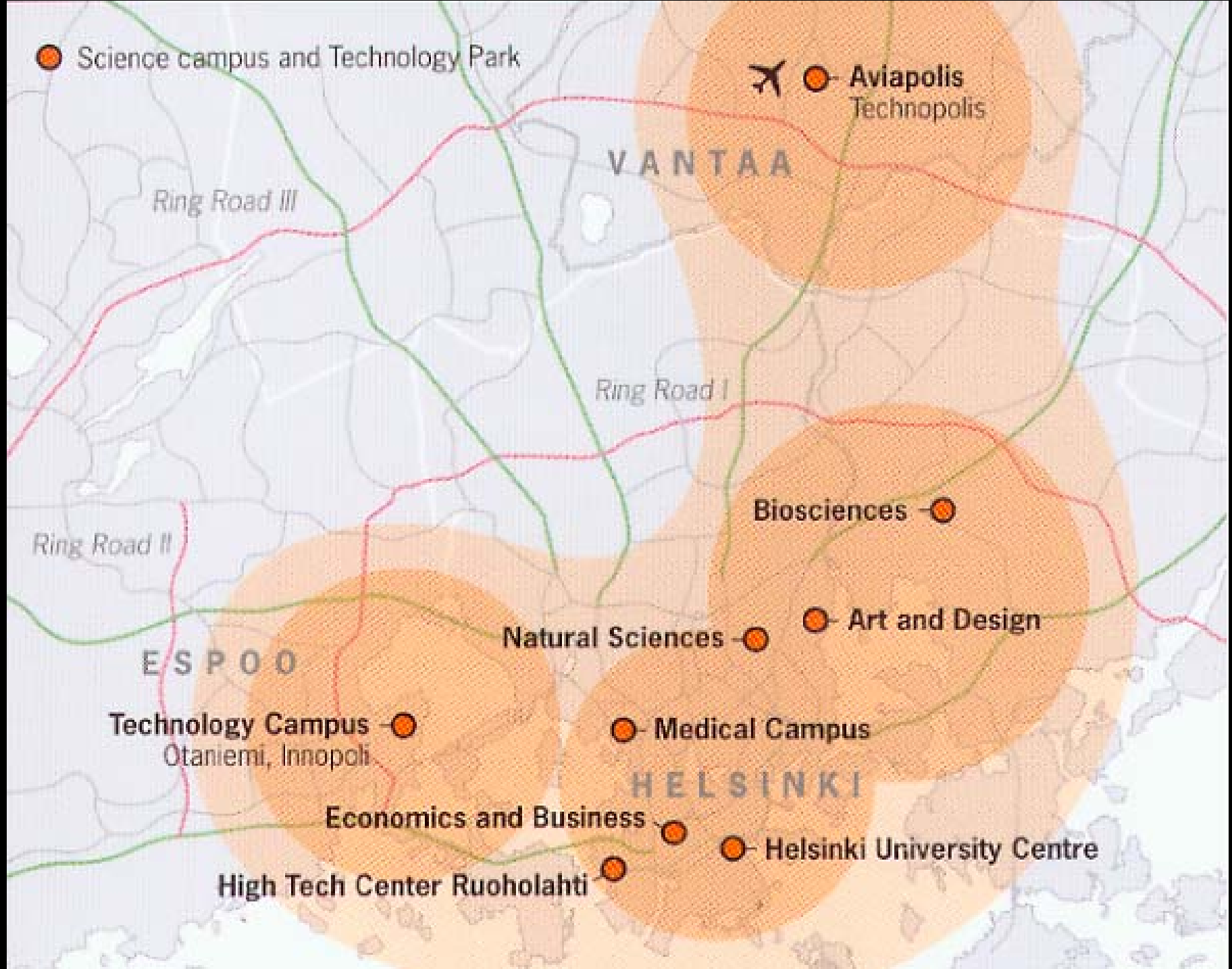
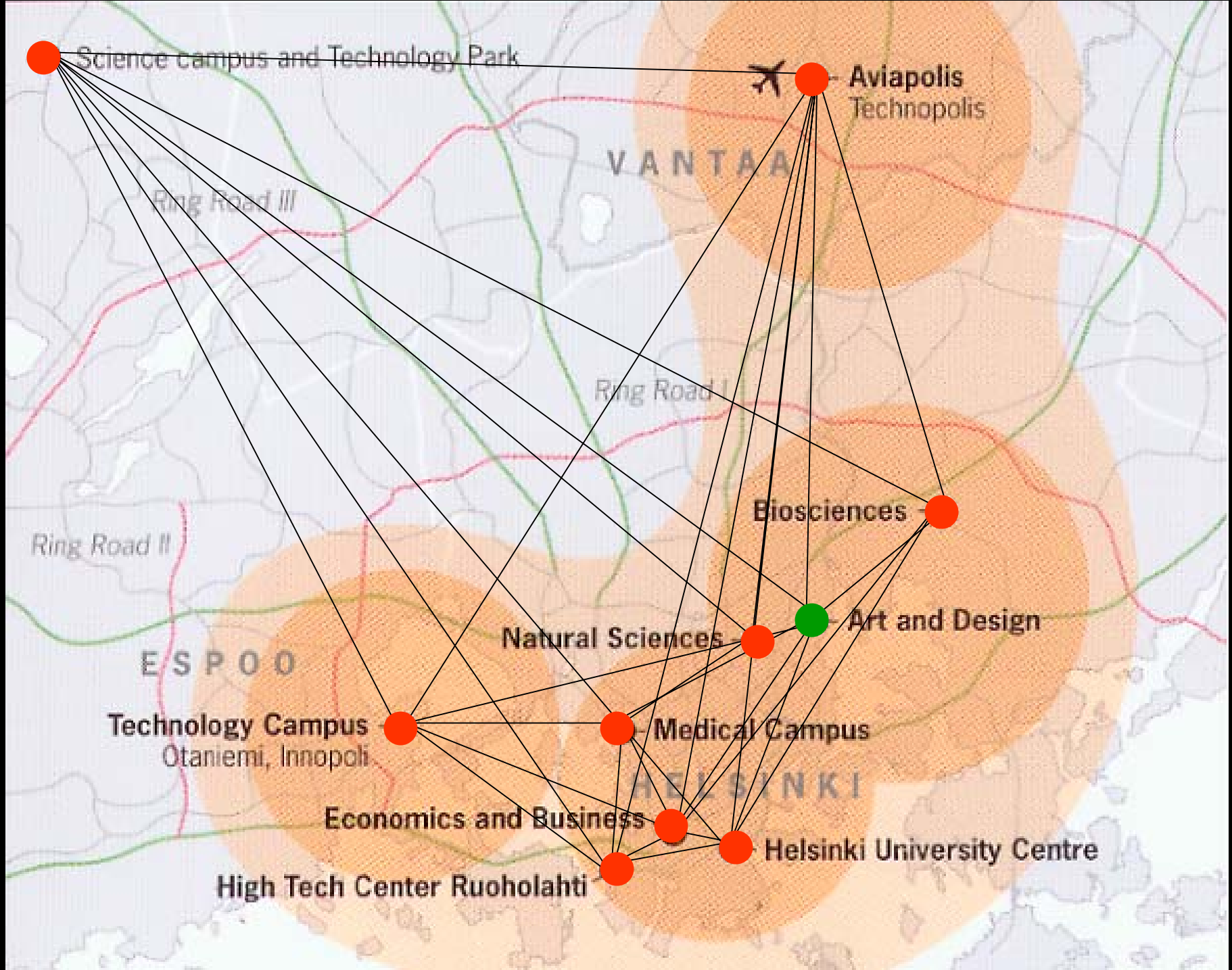

Science campus and Technology Park
Aviapolis
Technopolis
VANTAA
Ring Road III
Ring Road I
Ring Road II
Biosciences
Art and Design
Natural Sciences
ESPOO
Technology Campus
Otaniemi, Innopoli
Medical Campus
HELSINKI
Economics and Business
Helsinki University Centre
High Tech Center Ruoholahti


Science campus and Technology Park
Aviapolis
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VANTAA
Ring Road III
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Ring Road II
Art and Design
Natural Sciences
ESPOO
Technology Campus
Otaniemi, Innopoli
Medical Campus
HELSINKI
Economics and Business
Helsinki University Centre
High Tech Center Ruoholahti

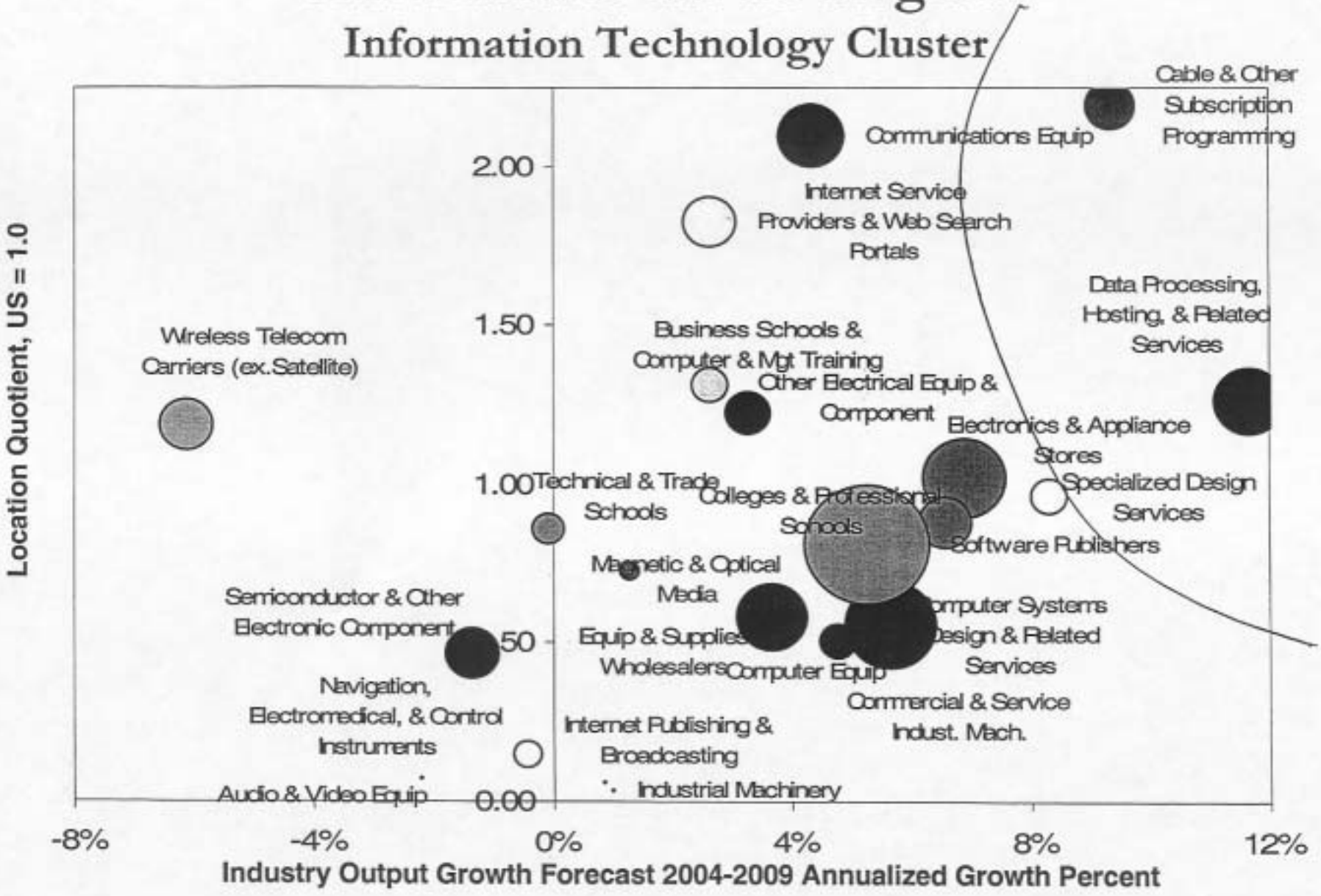
Hallowing of microelectronic manufacturing? Value shift…

transitioning from a manufacturing to an innovation economy

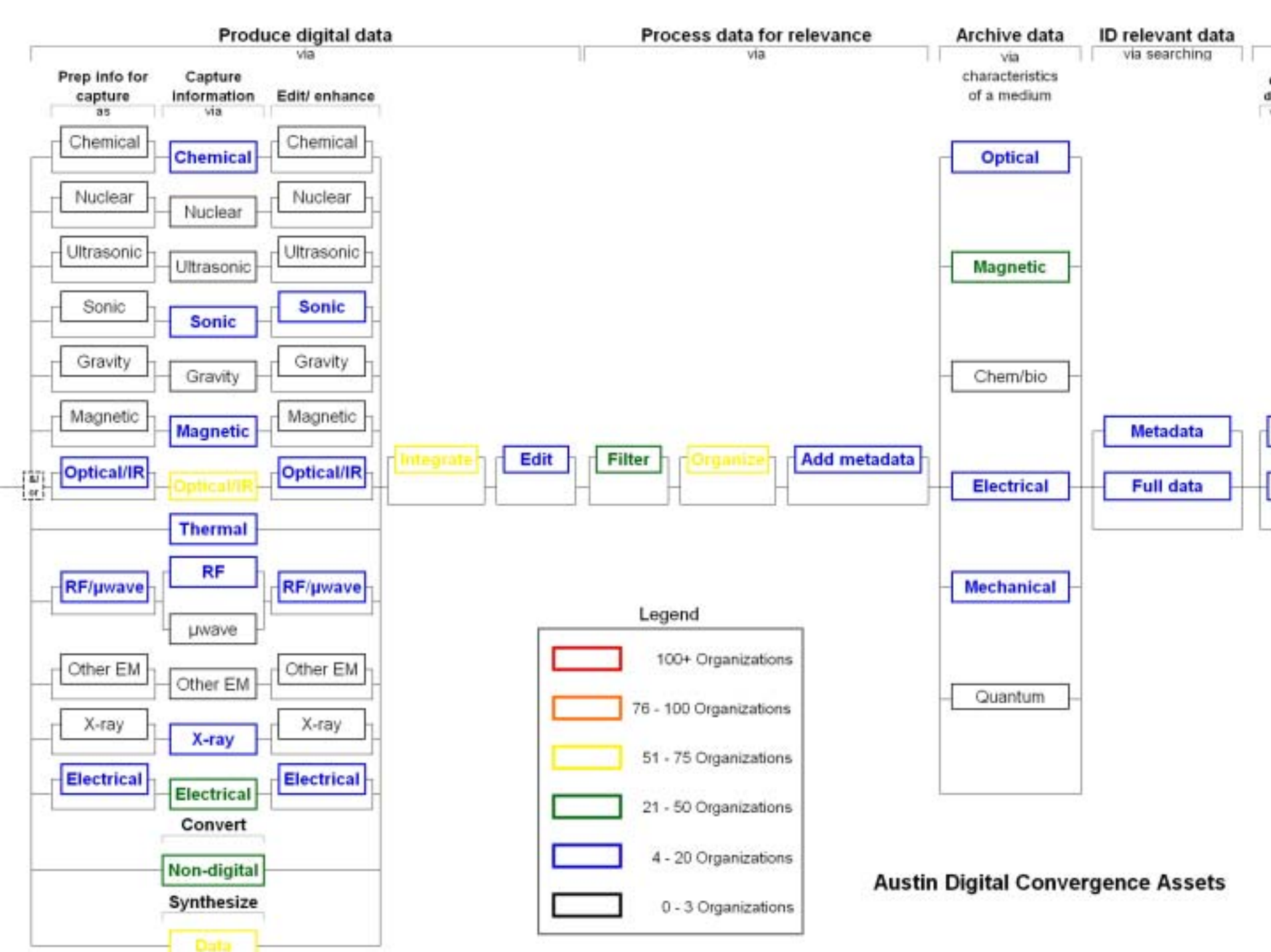
http://mit.edu/cre/research/ncc/proceedings/ncc-casestudies.pdf

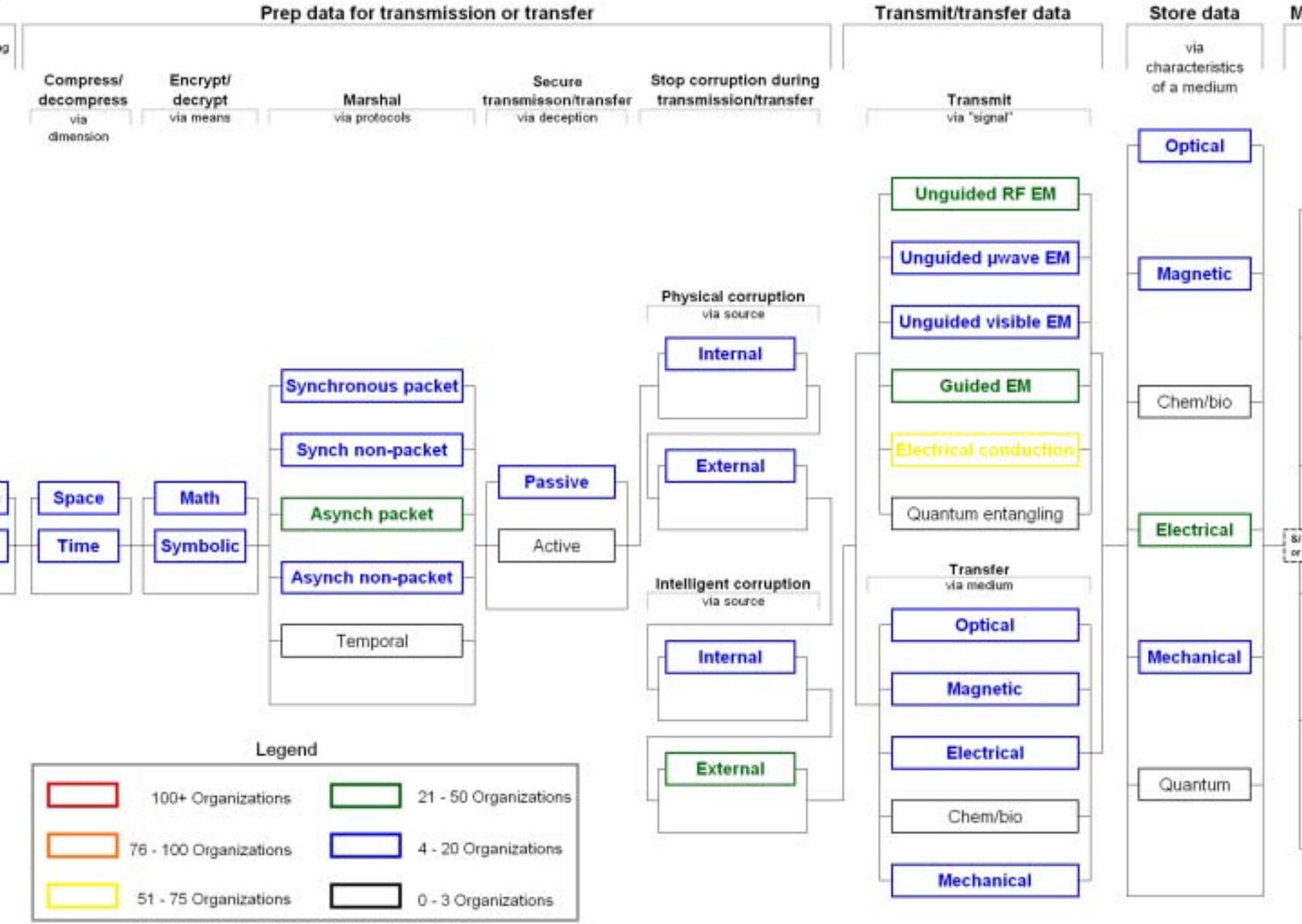
San Antonio Metro Region:

Information Technology Cluster

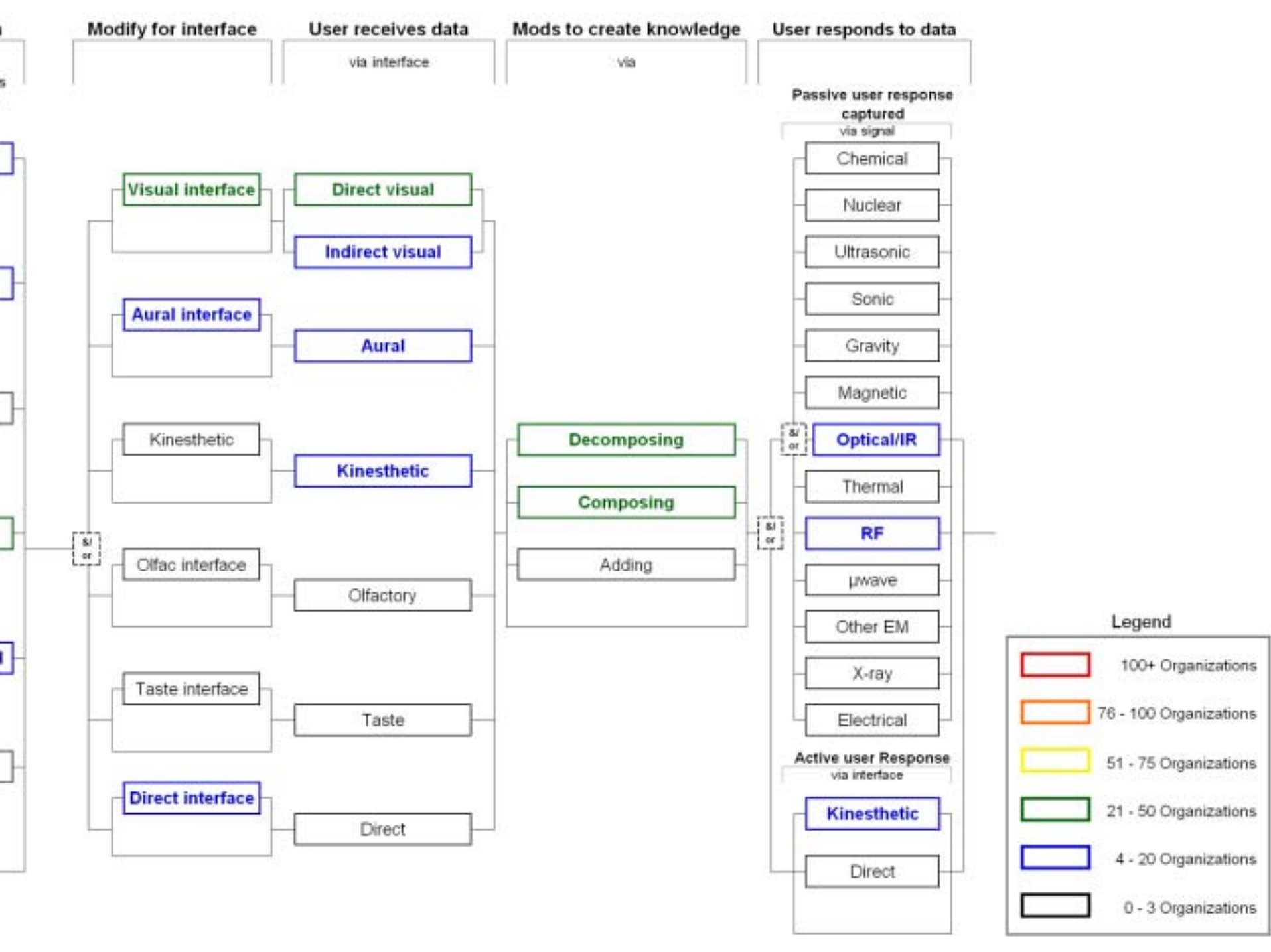


WFR: Alamo


Produce digital data
via
Prep info for capture
as
Capture information
via
Edit/ enhance
Chemical
Nuclear
Ultrasonic
Sonic
Gravity
Magnetic
Optical/IR
Thermal
RF/µwave
RF
µwave
Other EM
X-ray
Electrical
Convert
Non-digital
Synthesize
Data
Process data for relevance
via
Integrate
Edit
Filter
Organize
Add metadata
Archive data
via characteristics of a medium
Optical
Magnetic
Chem/bio
Electrical
Mechanical
Quantum
ID relevant data
via searching
Metadata
Full data
Legend
100+ Organizations
76 - 100 Organizations
51 - 75 Organizations
21 - 50 Organizations
4 - 20 Organizations
0 - 3 Organizations
Austin Digital Convergence Assets



Austin Digital Convergence Assets


Modify for interface
User receives data
via interface
Mods to create knowledge
via
User responds to data
Passive user response captured
via signal
Visual interface
Direct visual
Indirect visual
Aural interface
Aural
Kinesthetic
Kinesthetic
Olfac interface
Olfactory
Taste interface
Taste
Direct interface
Direct
&/or
Decomposing
Composing
Adding
Chemical
Nuclear
Ultrasonic
Sonic
Gravity
Magnetic
Optical/IR
Thermal
RF
µwave
Other EM
X-ray
Electrical
Active user Response
via interface
Kinesthetic
Direct
Legend
100+ Organizations
76 - 100 Organizations
51 - 75 Organizations
21 - 50 Organizations
4 - 20 Organizations
0 - 3 Organizations

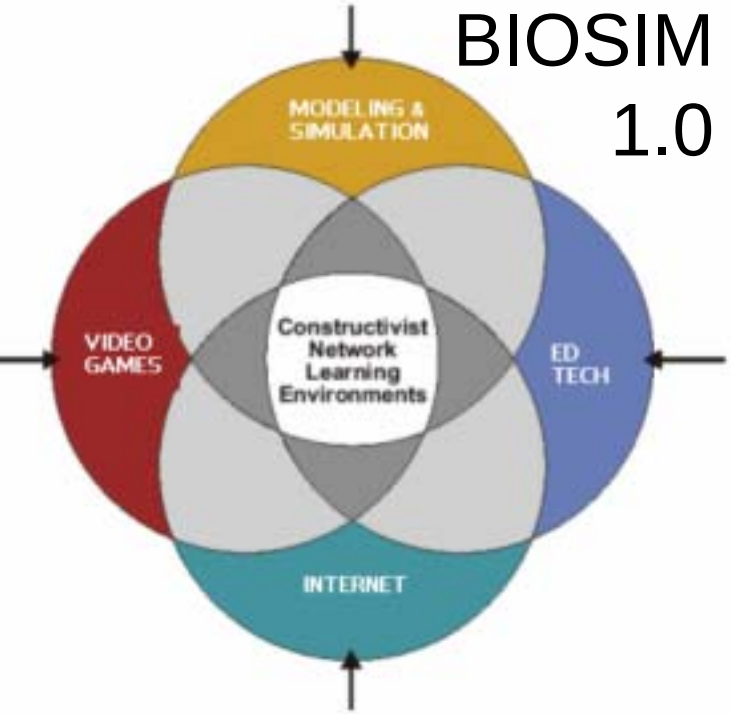
What K-12 educational solutions exist today?

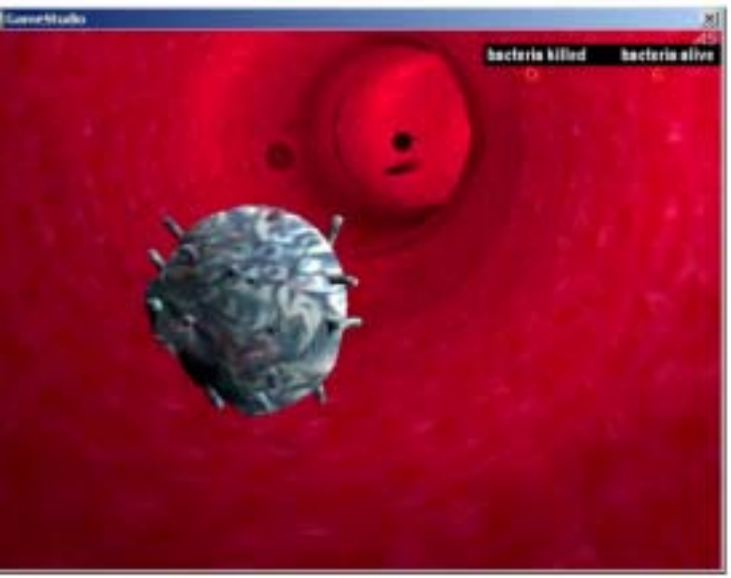
Transdisciplinarity

Workers with transdisciplinary skills are needed in government, military, industry, and academia (World Technology Evaluation Center; Turpin, 2000; Stanford University, 2002; Arts and Humanities Research Board; Daly, Farley, Thomson, 2001; MST News, 2003; World Technology Evaluation Center; Office of Scientific and Technical Information, 2002; TANSEI, 2002; De Marca, Gelman; Carty, 1998; Nanotechnology Research Institute). To meet the needs and challenges of modern science, industry and private sector leaders are calling for a revolution in teaching.

> "Half a millennium ago, Renaissance leaders were masters of several fields simultaneously. Today, however, specialization has splintered the arts and engineering, and no one can master more than a tiny fragment of human creativity. The sciences have reached a watershed at which they must combine if they are to continue to advance rapidly. Convergence of the sciences can initiate a new renaissance, embodying a holistic view of technology based on transformative tools, the mathematics of complex systems, and unified cause-and-effect understanding of the physical world from the nanoscale to the planetary scale.
>
> ***"Educational institutions at all levels should undertake major curricular and organizational reforms to restructure the teaching and research of science and engineering so that previously separate disciplines can converge around common principles to train the technical labor force for the future.***
>
> "Manufacturing, biotechnology, information and medical service corporations will need to develop partnerships of unparalleled scope to exploit the tremendous opportunities from technological convergence, investing in production facilities based on entirely new principles and materials, devices and systems, with increased emphasis on human development." (World Technology Evaluation Center, 2002)

BIOSIM 1.0





Yang Cai, Ingo Snel, Betty Chenga, Suman Bharathi, Clementine Klein d, Judith Klein-Seetharaman; C*arnegie Mellon University, University of Frankfurt, Research Institute, University of Pittsburgh School of Medicine.*

1985 - 2001
Computers
in Support of
Inquiry Learning

James M. Bower, Ph.D.
2002 - Present
Professor of Computational Neuroscience, UTHSC and UTSA

numedeon, inc.

www.Whyville.net

Population: 1.4MM **Growth: 1200/day**

The average time per log in July was 3.8 hours making it second to Neopets.

MEAN TIME PER USER LOGIN

Educational Sites	3 - 5 minutes
EA online games	9 minutes
AOL Entertainment	10 minutes
Whyville.net	59 minutes
Yahoo! Games	78 minutes

PAGE VIEWS

Discovery.com:	96 million
Whyville.net:	58.4 million
BigChalk:	11 million
Time for Kids:	8 million
New York Times Learning Net:	1.2 million
Cosmogirl:	425,000

FREE


National Aeronautics
and Space Administration
T-minus 25143
seconds.
WASA
SIATF

Rocket is launching...

Engine Type: Space Shuttle

Fuel Volume: 56

Nozzle Size: 5

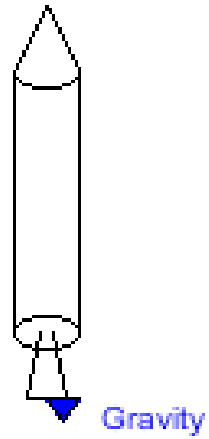
Oxygen Bottles: 0

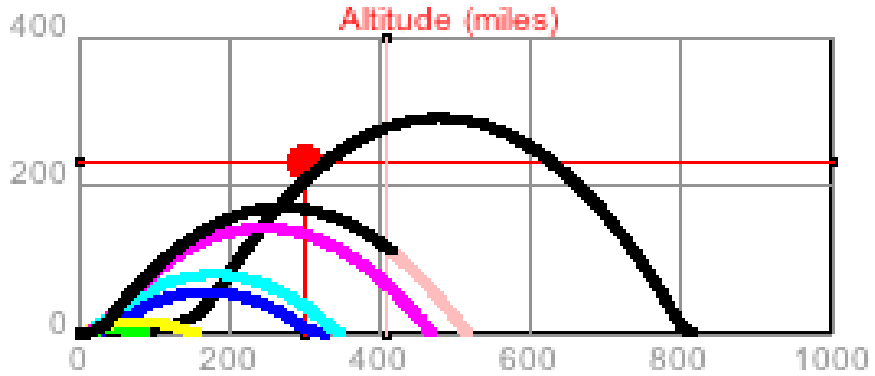
Launch

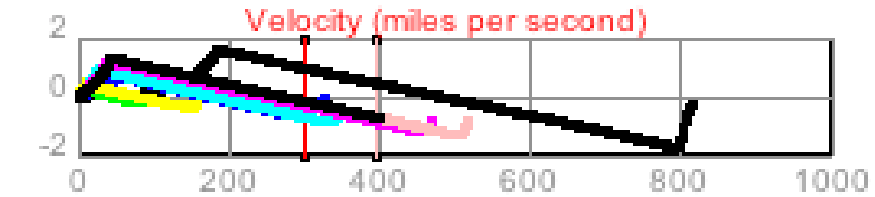
Clear

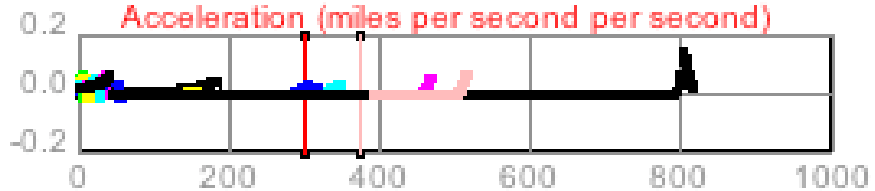
Submit

423









Time (in seconds)

Distance To Space Station:

131 miles

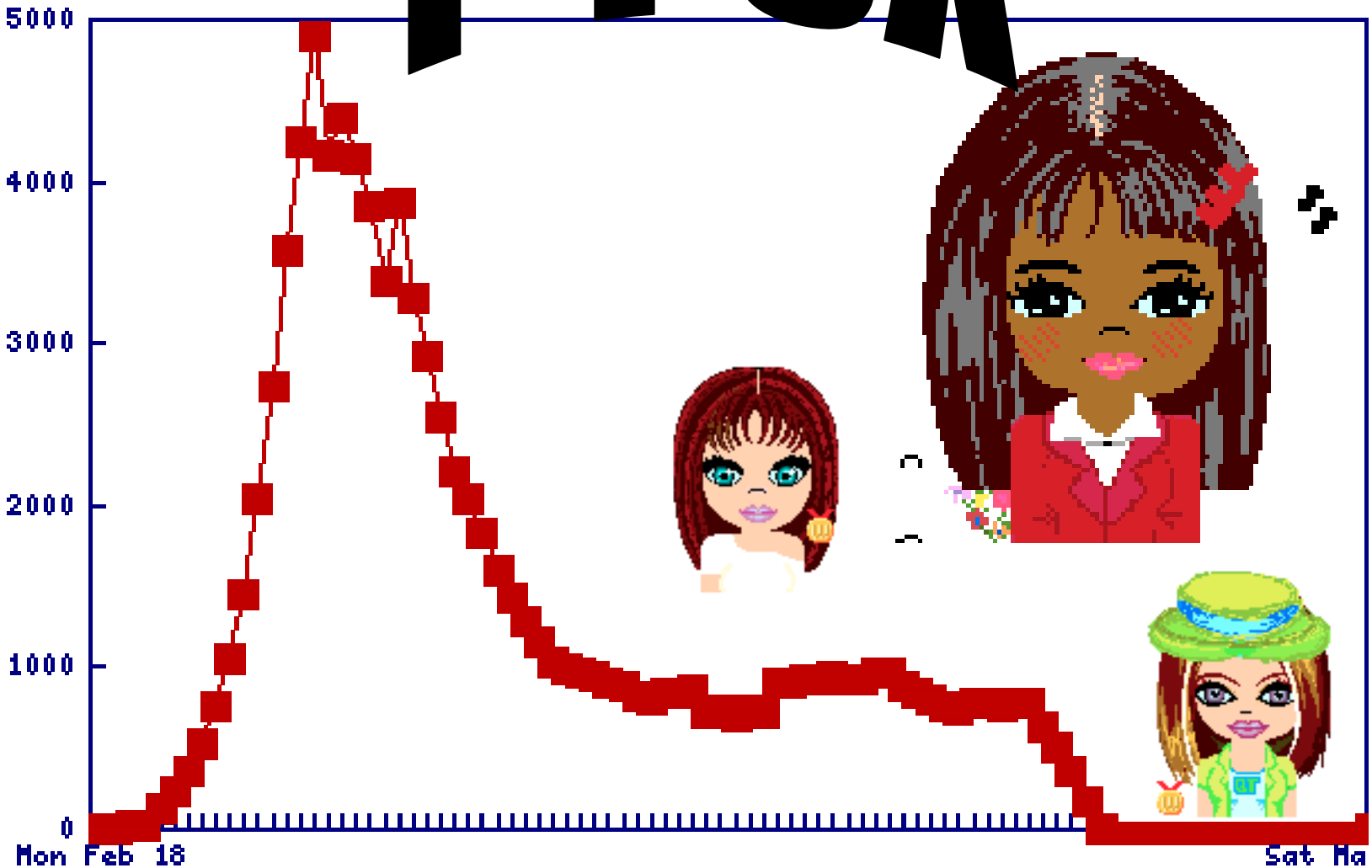
Rocket Speed:

3148 mph

Time Until Overhead:

5393 seconds

Y-POX



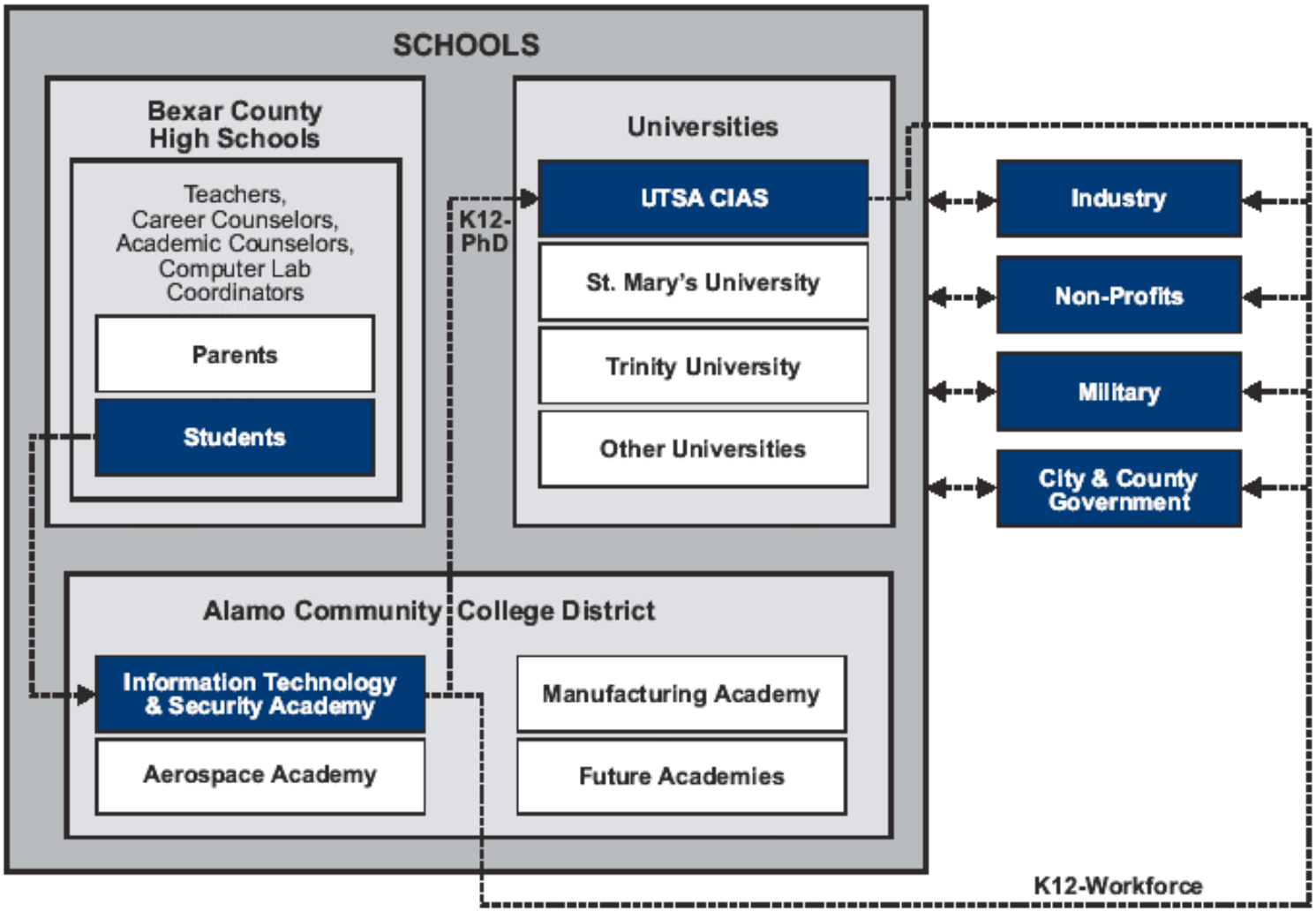
Feb. 14- March 13, 2002 Day

3,000 BBS postings

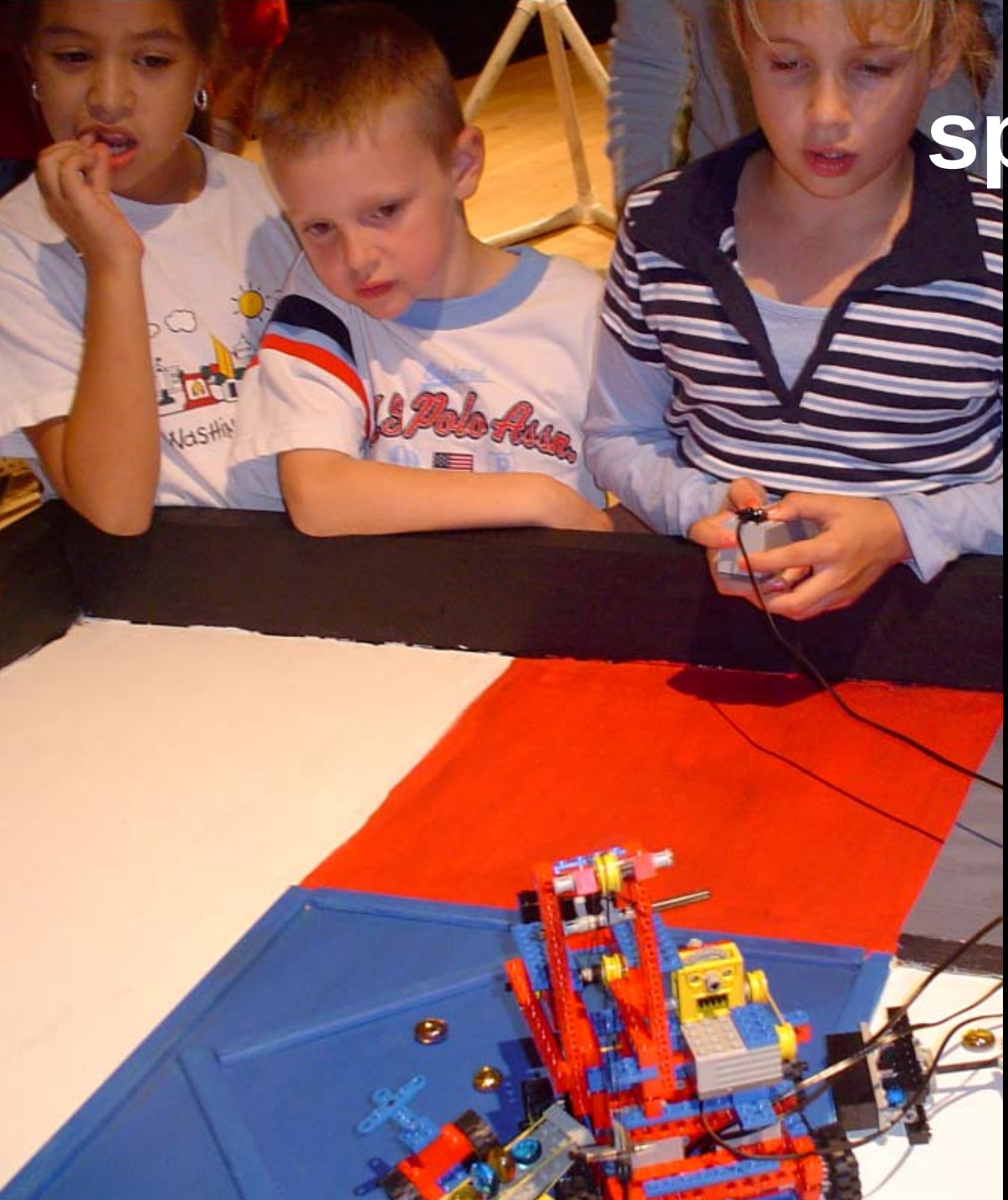

achoo

Greg White, UTSA:

"K-PhD"



Brazell, Monroe, 2003



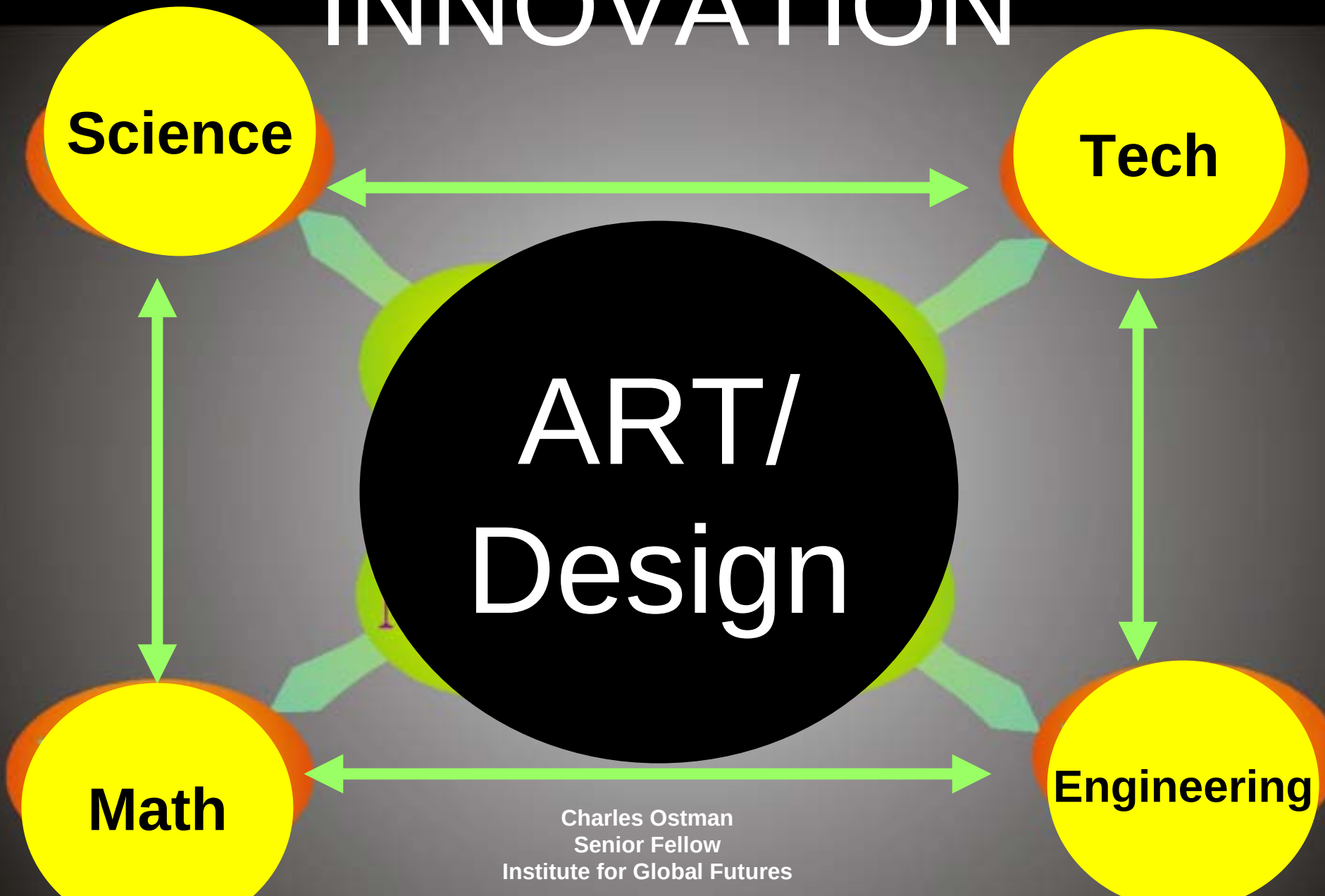
spaceTEAMS

San Antonio,TX

Robot competition plus career and academic exploration and history of science and technology.

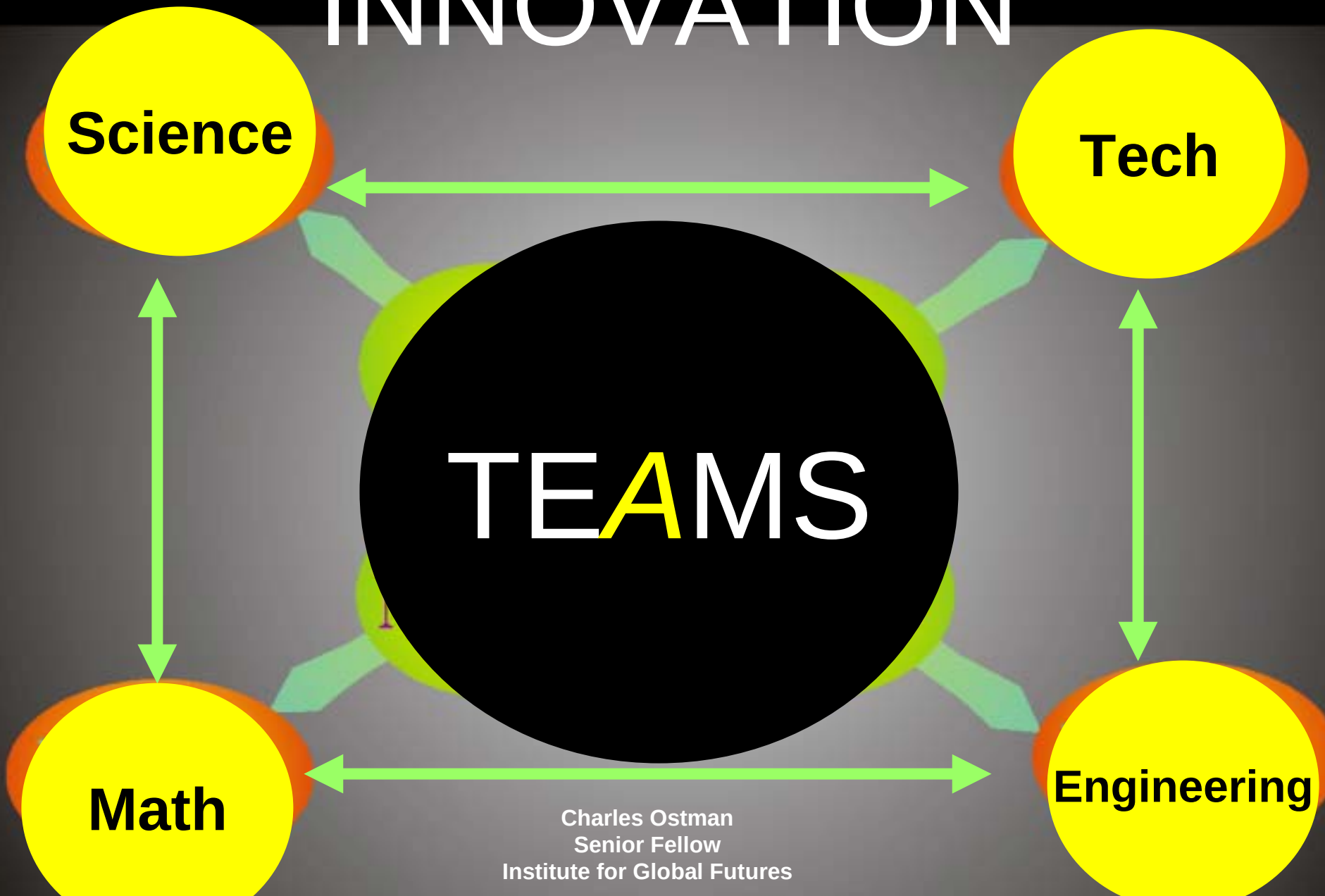
Elementary

INNOVATION



Charles Ostman
Senior Fellow
Institute for Global Futures

INNOVATION



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Institute for Global Futures

spaceTEAMS

San Antonio,TX

Middle School

Like football or volleyball but academic.

spaceTEAMS

San Antonio,TX

High School

AEROSPACE

BIOSCIENCE

INFORMATION TECHNOLOGY

TELECOMMUNICATIONS

DIGITAL MEDIA

HOMELAND SECURITY

Tech in San Antonio
BELIEVE IT!

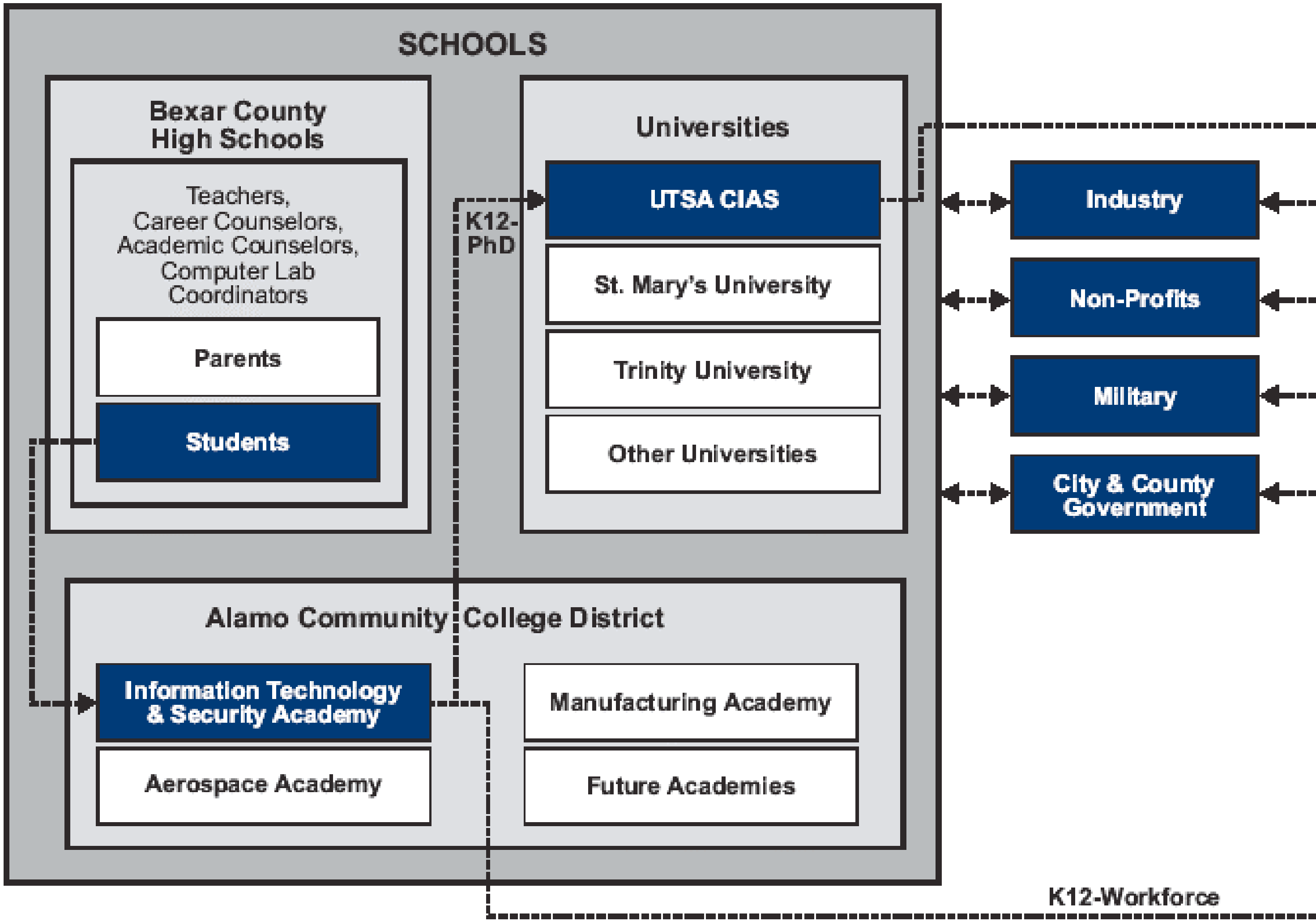
www.satai-network.com

Pipeline

Start younger!

Greg White, UTSA:

"K-PhD"



TEAMS

Northwest Vista College, San Antonio

Brazell, Monroe, 2003

What can Industry Do?

“Innovate or Abdicate!”

“For the past 25 years, we have optimized our organizations for efficiency and quality. Over the next quarter century, we must optimize our entire society for innovation. ”

Innovate America, U.S. Council on Competitiveness

“Innovate or Abdicate!”

- Communicate Workforce Needs to Colleges
- Partner with Colleges on Grants
  - Skills Development Fund, Perkins State Leadership, President’s High Growth Jobs Initiatives
- Donate CURRENT Equipment
- Serve on Program Advisory Committees
- Provide Adjunct Faculty
- Support Student & Faculty Co-Cooperatives
- Sponsor Department Chairs
- Sponsor Student Scholarships
- Donate to College Foundations

New TSTC Corporate College

- Single point of contact for both public and private training requests made of TSTC statewide.
- TSTC will assesses training needs, develop customized training plans, and perform corporate training consulting services.
- Deliver the training programs at any of TSTC's locations across the state, or at the company's facility using the company's actual equipment.
- Assistance to business and industry for new and incumbent workforce development.

Contact:

TSTC Corporate College
Mike Harder, President
(254) 867.3940
mike.harder@tstc.edu

What is your NEW workforce need?