Bourns College of Engineering
College Annual Meeting
June 10, 2015

Reza Abbaschian

BCOE at a Glance

- **U.S. News Ranking**   71, top one-third among those ranked (39th among public universities)
- **Leiden Ranking**   8th among 750 international research universities in physical sciences and engineering
- **National Research Council**   Top quartile
- **Faculty**   96   (goal to increase to 140 by 2020)
- **Undergraduate Enrollment**   2,364   (projected to increase to 3,000 by 2020)
- **Graduate Enrollment**   667   (projected increase to 700 PhD and 500 MS by 2020)
- **Research Expenditures** $42 million   (projected to increase to $80-100M by 2020)
- **IDC generated** $4.1 million (Returned ~ $1.5M)
- **Endowment Support** $36 million
- **Endowed Professorships**   10
- **Philanthropic Gifts ('12)** $3.6 million received
- **NAE Member**   2
- **Fellows of Professional Societies** 81
- **NSF Career Awards**   46 (cumulative)
- **Diversity**   34 percent URM (2009 Claire Felbinger from ABET for outstanding service to URM)

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CWTS Leiden Ranking

The CWTS Leiden Ranking 2015 offers key insights into the scientific performance of 750 major universities worldwide. A sophisticated set of bibliometric indicators provides statistics on the scientific impact of universities and on universities' involvement in scientific collaboration.

Rank	University	Country	P	PP(top 10%)	Stability interval
1	Boston Coll	🇺🇸	271	26.5%	
2	Stanford Univ	🇺🇸	3414	26.0%	
3	Harvard Univ	🇺🇸	3397	25.1%	
4	Univ Calif - Santa Barbara	🇺🇸	2047	24.6%	
5	MIT	🇺🇸	4672	24.3%	
6	Rice Univ	🇺🇸	1126	23.8%	
7	Univ Calif - Berkeley	🇺🇸	4693	23.8%	
8	Univ Calif - Los Angeles	🇺🇸	2419	22.5%	
9	Univ Penn	🇺🇸	1442	21.7%	
10	Princeton Univ	🇺🇸	2340	21.5%	
11	Northwestern Univ	🇺🇸	2571	21.2%	
12	Yale Univ	🇺🇸	1278	21.1%	
13	Univ Calif - San Francisco	🇺🇸	228	21.0%	
14	Kent State Univ	🇺🇸	292	20.8%	
15	Univ Chicago	🇺🇸	1133	20.6%	
16	Caltech	🇺🇸	2999	20.5%	
17	Univ Calif - Riverside	🇺🇸	951	20.1%	
18	Univ Colorado - Boulder	🇺🇸	1792	19.9%	
19	Emory Univ	🇺🇸	505	19.9%	
20	Univ Texas - Southwestern Med Ctr	🇺🇸	145	19.8%	
21	Univ Calif - Santa Cruz	🇺🇸	699	19.8%	
22	Univ Texas Hlth Sci Ctr - Houston	🇺🇸	224	19.7%	
23	Univ Washington - Seattle	🇺🇸	1918	19.4%	
24	Univ N Carolina - Chapel Hill	🇺🇸	874	19.3%	
25	Weizmann Inst Sci	🇮🇱	1050	19.2%	

0%   10%   20%   30%   40%

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CWTS Leiden Ranking
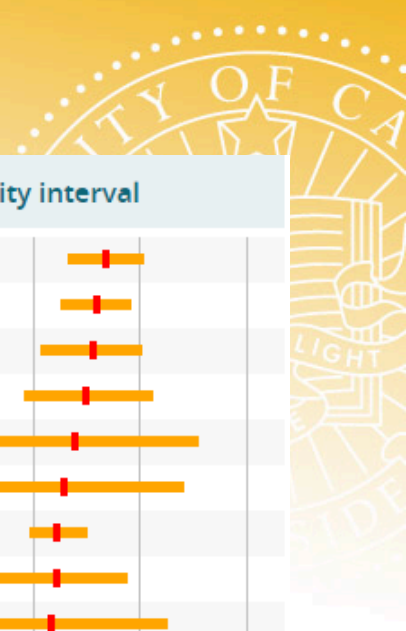
Rank	University	Country	P	PP(top 1%)	Stability interval
1	Stanford Univ	🇺🇸	3414	4.0%	
2	Harvard Univ	🇺🇸	3397	3.9%	
3	Univ Calif - Santa Barbara	🇺🇸	2047	3.9%	
4	Rice Univ	🇺🇸	1126	3.8%	
5	VU Univ Amsterdam	🇳🇱	338	3.6%	
6	Univ Calif - San Francisco	🇺🇸	228	3.5%	
7	MIT	🇺🇸	4672	3.4%	
8	Univ Calif - Riverside	🇺🇸	951	3.3%	
9	Kent State Univ	🇺🇸	292	3.3%	
10	Univ Calif - Berkeley	🇺🇸	4693	3.2%	
11	Univ Québec Montréal	🇨🇦	150	3.2%	
12	Caltech	🇺🇸	2999	3.1%	
13	Univ Calif - Los Angeles	🇺🇸	2419	3.1%	
14	Emory Univ	🇺🇸	505	3.0%	
15	Northwestern Univ	🇺🇸	2571	3.0%	
16	Boston Coll	🇺🇸	271	3.0%	
17	Yale Univ	🇺🇸	1278	2.9%	
18	Princeton Univ	🇺🇸	2340	2.9%	
19	Univ Amsterdam	🇳🇱	728	2.7%	
20	Case Western Reserve Univ	🇺🇸	767	2.6%	
21	W Virginia Univ	🇺🇸	480	2.6%	
22	Virginia Commonwealth Univ	🇺🇸	438	2.6%	
23	NYU	🇺🇸	848	2.5%	
24	Univ Colorado - Boulder	🇺🇸	1792	2.5%	
25	Ewha Womans Univ	🇰🇷	597	2.5%	

0% 1.5% 3% 4.5% 6%

BCOE Planned (2006) Vs. Actual
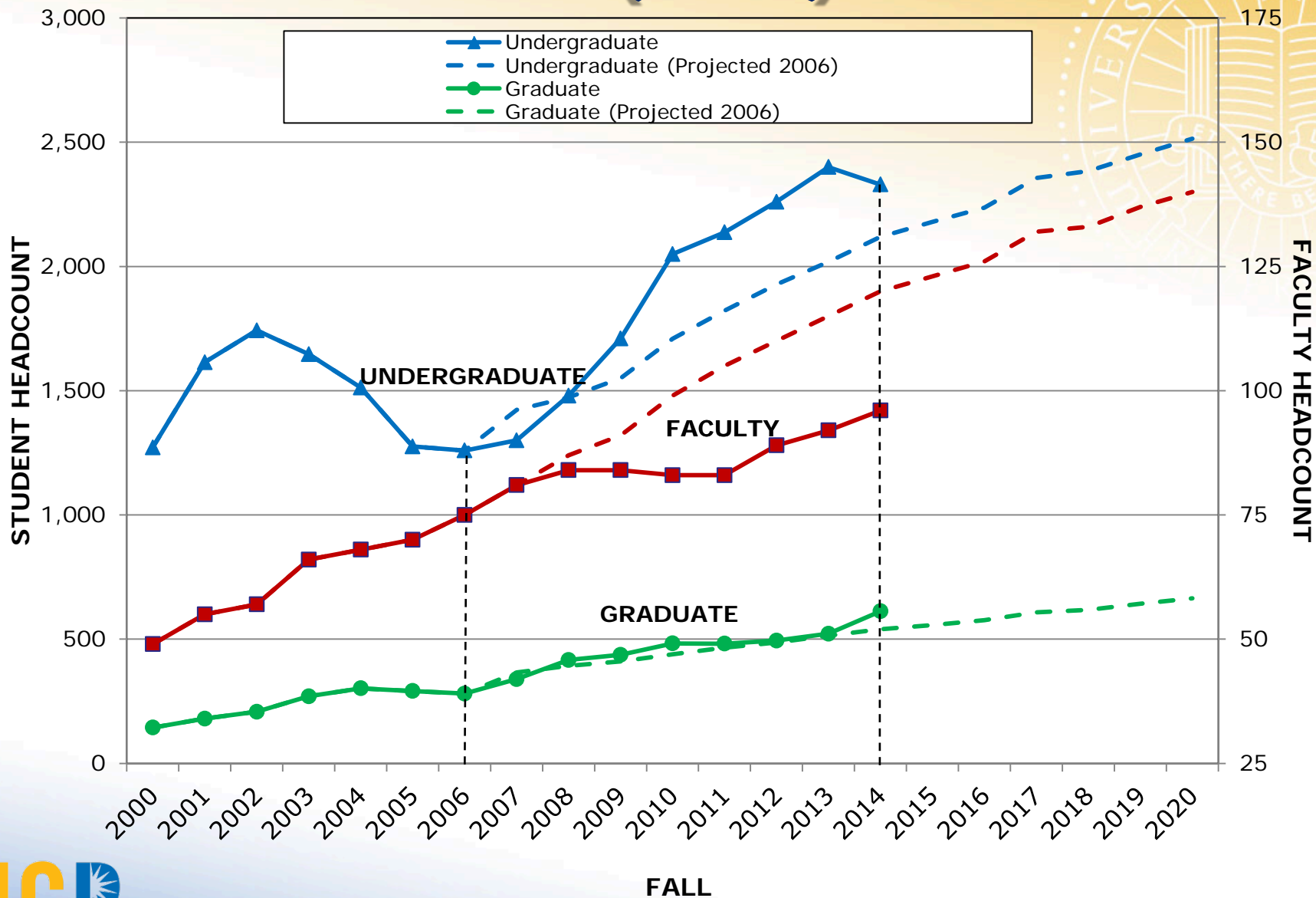
BCOE vs UC vs Top 25

UC Campuses	Rank	#Fac	Degrees Awarded			Degree Per Faculty			Enrollment			S/F Ratios			GS Fraction (%)	
			B.S.	M.S.	Ph.D	B.S.	M.S.	Ph.D	UG	M.S.	Ph.D	UG	M.S.	Ph.D	Dom	URM
UC Berkeley	3	247	1,079	436	243	4.4	1.8	1.0	4,019	399	1,537	16.3	1.6	6.2	61.9%	9.6%
UC Davis	31	198	600	218	132	3.0	1.1	0.7	3,503	383	747	17.7	1.9	3.8	61.8%	8.2%
UC Irvine	38	115	539	259	92	4.7	2.3	0.8	3,235	339	465	28.1	2.9	4.0	DNR	DNR
UC Los Angeles	16	155	682	545	160	4.4	3.5	1.0	3,158	914	940	20.4	5.9	6.1	49.8%	11.5%
UC Riverside	**69**	**91**	**305**	**67**	**58**	**3.4**	**0.7**	**0.6**	**2,400**	**134**	**460**	**26.4**	**1.5**	**5.1**	**49.0%**	**21.0%**
UC San Diego	14	194	1,057	419	144	5.4	2.2	0.7	6,503	691	1,024	33.5	3.6	5.3	50.8%	9.7%
UC Santa Barbara	19	124	290	124	101	2.3	1.0	0.8	1,347	178	587	10.9	1.4	4.7	55.2%	5.4%
UC Santa Cruz	81	78	321	44	31	4.1	0.6	0.4	1,788	86	302	22.9	1.1	3.9	71.6%	10.4%
UC Totals		1,202	4873	2112	961				25,953	3,124	6,062					
Average	**34**	**150**	**609**	**264**	**120**	**4.0**	**1.6**	**0.8**	**3,244**	**391**	**758**	**21.6**	**2.6**	**5.0**	**51.0%**	**8.4%**

Top 25 Public (Non-UC)	Rank	#Fac	Degrees Awarded			Degree Per Faculty			Enrollment			S/F Ratios			GS Fraction (%)	
			B.S.	M.S.	Ph.D	B.S.	M.S.	Ph.D	UG	M.S.	Ph.D	UG	M.S.	Ph.D	Dom	URM
Georgia Tech	6	436	1,823	1,051	313	4.2	2.4	0.7	9,278	1,766	2,138	21.3	4.1	4.9	54.5%	11.9%
Illinois	6	406	1,604	583	282	4.0	1.4	0.7	8,186	1,421	1,733	20.2	3.5	4.3	37.0%	8.3%
Purdue	8	307	1,405	510	232	4.6	1.7	0.8	7,742	1,383	1,702	25.2	4.5	5.5	45.3%	9.8%
Michigan	8	381	1,299	1,115	245	3.4	2.9	0.6	5,923	1,642	1,538	15.5	4.3	4.0	46.5%	11.2%
Texas	10	277	1,100	392	231	4.0	1.4	0.8	5,611	747	1,413	20.3	2.7	5.1	50.0%	10.9%
Texas A&M	11	328	1,394	566	285	4.3	1.7	0.9	8,390	1,544	1,522	25.6	4.7	4.6	35.3%	17.3%
Wisconsin	17	186	692	401	101	3.7	2.2	0.5	4,347	749	906	23.4	4.0	4.9	49.6%	9.4%
Virginia Tech	21	317	1,331	456	213	4.2	1.4	0.7	7,177	848	1,345	22.6	2.7	4.2	56.5%	8.3%
Maryland	22	208	832	521	130	4.0	2.5	0.6	3,834	1,040	882	18.4	5.0	4.2	54.6%	17.8%
Penn State	25	353	1,653	386	183	4.7	1.1	0.5	10,201	556	1,163	28.9	1.6	3.3	38.3%	7.4%
Average	**13**	**320**	**1,313**	**598**	**222**	**4.1**	**1.9**	**0.7**	**7,069**	**1,170**	**1,434**	**22.1**	**3.7**	**4.5**	**46.8%**	**11.5%**
Average (including UC)		**280**	**1,160**	**536**	**205**	**4.1**	**1.9**	**0.7**	**6,123**	**991**	**1,316**	**21.6**	**3.5**	**4.8**	**48.3%**	**11.1%**

Retreat Goals

- **Engage faculty and staff in Strategic Planning**

- **Reassess our vision and update if necessary**

- **Identify & commit to the overall strategy to achieve our vision**

- **Develop and implement a plan supporting our strategy with achievable goals & milestones**

Retreat 2015

And our biggest news item…

We broke our faculty population! Broke it in the sense that we are now over 100 faculty strong!
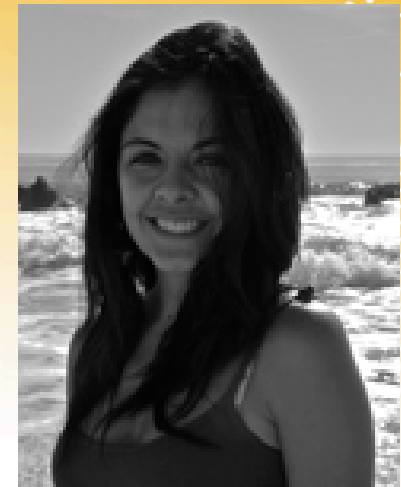
UCR

Kelly Barsanti
CEE/CE-CERT
Assistant Professor

Jiasi (Jessie) Chen
CSE
Assistant Professor

Monica Martinez Ortiz
CSE
Assistant Professor

Shaolei Ren
ECE/CEN
Assistant Professor

Zhijia Zhao
CSE
Assistant Professor

P. Alex Greaney
ME/MSE
Assistant Professor

Richard B. Wilson
ME/MSE
Assistant Professor

Daniel Wong
ECE/CEN
Assistant Professor

Pending Hires:
2 or 21/2 BIEN (Full)
1 CSE (Full)
1 Continuing ME/CEE

9 positions was authorized initially

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GRADUATE EDUCATION

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Graduate Student Enrollment
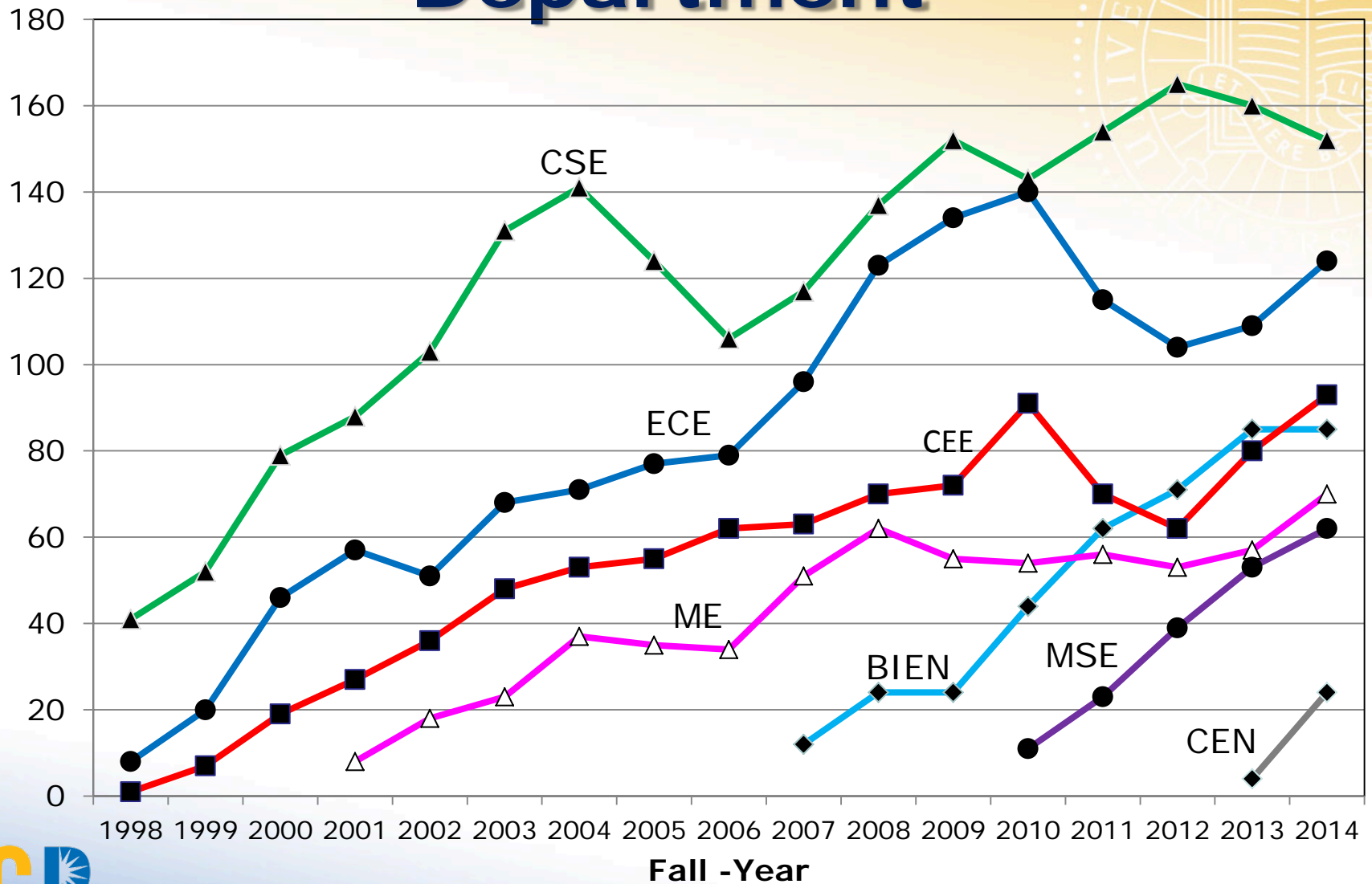
Graduate Degrees Awarded
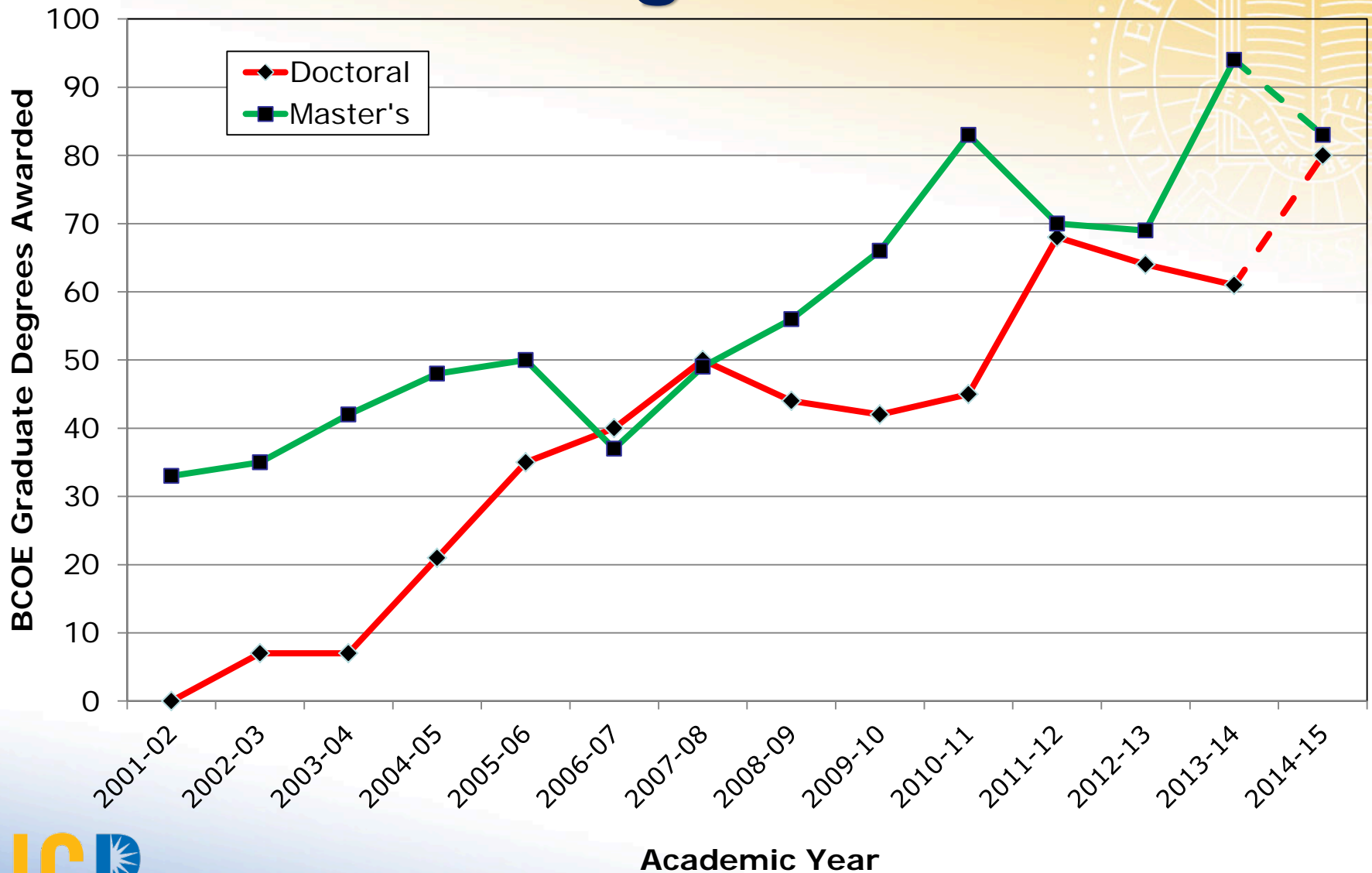
Master's On-Line
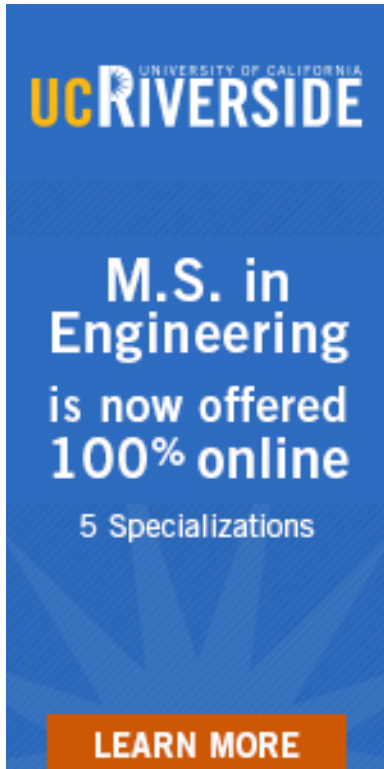
- A self-supporting program, which has been set up for highly qualified employed engineers who, for professional and personal reasons, are not able to attend traditional M.S. programs, yet are interested in obtaining the latest knowledge base of engineering and technology related to their area of work.

- Program discussions initiated in 2008, with a proposal submitted in 2009. Final approval by President Yudoff in 2012.

- We started the program with a specialization drawn from Bioengineering in 2013, and will expand to 10 specializations in five years.

- MSOL program is unique amongst the competing online programs since it offers an effective and well-balanced blend of professional core engineering management and specialization courses.

UNIVERSITY OF CALIFORNIA
UC RIVERSIDE

M.S. in Engineering
is now offered
100% online

5 Specializations

LEARN MORE

'Transforming Engineers Into Leaders'

- The online Master of Science in Engineering is a comprehensive engineering program that encompasses both leadership strategy and technical skills.

- **36 total credits:**
- 16 credits of core courses
- 16 credits of specialization courses
- 4 credits of a capstone course

Mechanical Engineering

Environmental Engineering Systems (water)

Materials at the Nanoscale

Five Specializations

Bioengineering

Electrical Engineering (Power Systems)
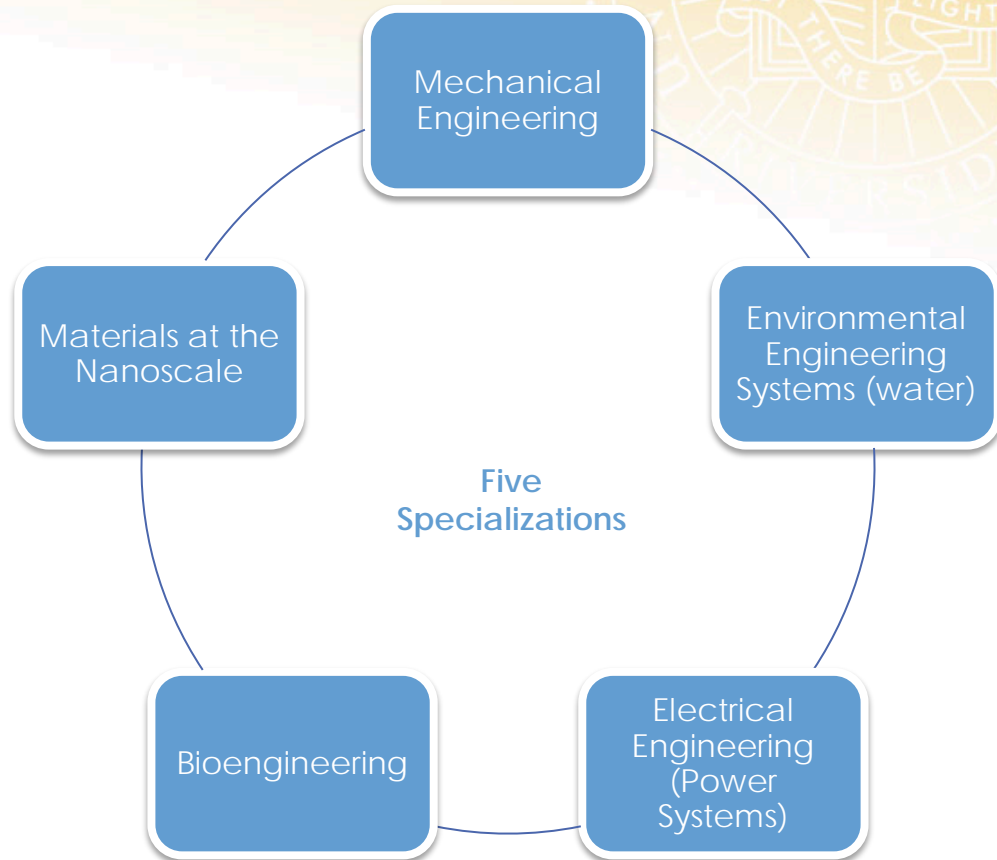
Pearson Partnership
Marketing, Recruitment and Student Support

- Approved 9/12/2014
- 11 member team
- Site Launch 4/20/2015

- 926 leads since 4/20/15

Marketing

Recruitment

UC Riverside

Student Support
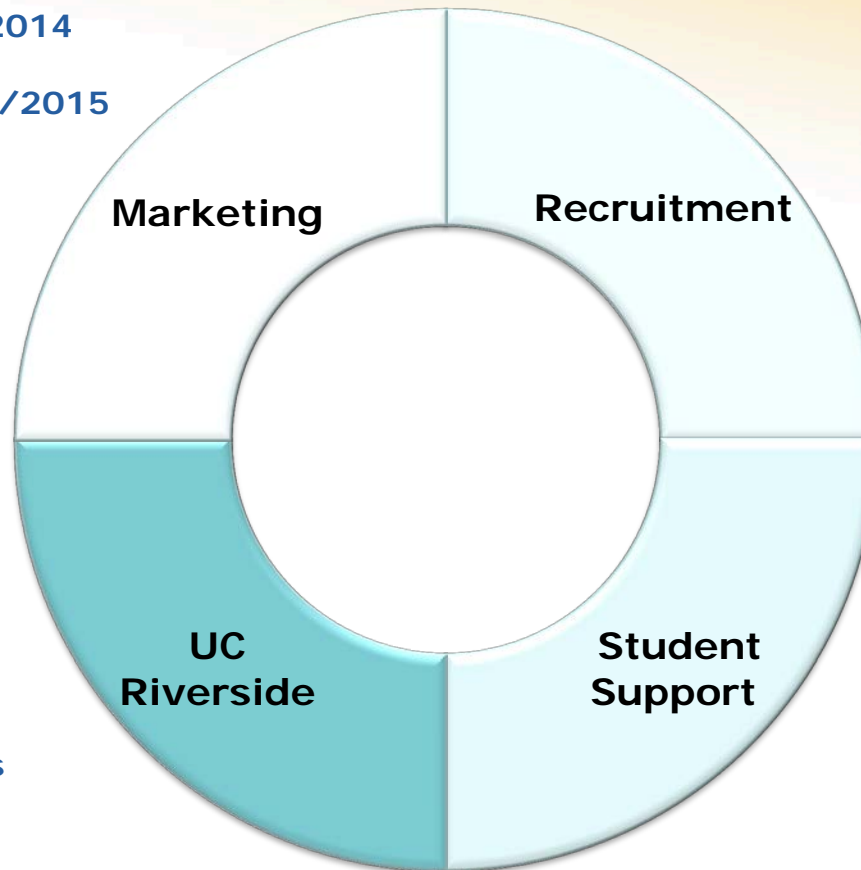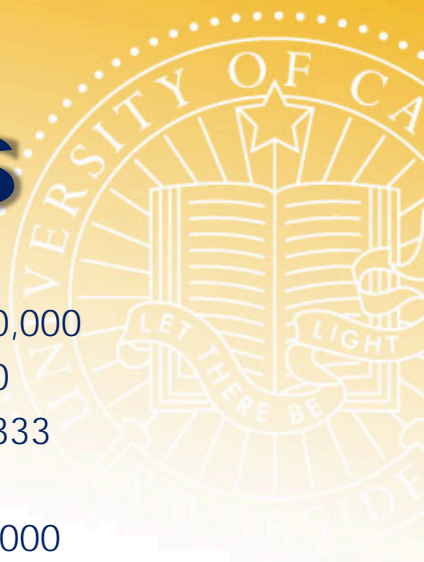
- Steering committee meeting to be held fall 2015 to assess results and set goals
- On-going development and feedback to ensure the highest academic quality

- 1 accepted student for fall 2015 so far with a total goal of 10 (12 weeks to deadline)
- 3 new applications are accepted by the MSOL oversight committee awaiting final processing
- 11 other student applications have been started and awaiting materials

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Costs/Benefits

- Total Tuition/student $30,000
- Application fee (US citizens) $80
- Cost per course $3333

Online-Course Develop/Mgmt Fees

- Cost to develop 1st offering of new online course $5,000
- Cost to update for each subsequent offering $1,000
- Cost to update existing grad course to on-line $2,000
- Instructional Services Fee (per student/offering) $500

Instructional Support

- Instructor compensation (per student/offering) $400
- .25-FTE TA/Reader costs/offering (on-line enrollment >5) $6,027
- .125-FTE TA/Reader costs/offering (on-line enrollment 1-5) $3,014

DIRECT DOCTORAL ADMISSION PROGRAM (DDAP)

- Partnership with HBCUs
  - Promising juniors identified by HBCU faculty (GPA>3.3)
  - Students invited to participate in UCR Mentoring Summer Research Internship Program (MSRIP) working with BCOE faculty member
    - Graduate application preparation
    - Research experience
    - Assessment by BCOE faculty member
    - Applies for National GEM Fellowship
  - Student prospect applies to BCOE PhD program (maintain GPA>3.3)
    - Participates in UCR GradEDge program preceding matriculation
    - Assistance in applying for National Science Foundation Graduate Research Fellowship (NSF GRF) and a National Defense Science and Engineering Graduate Fellowship (NDSEG)
    - Consideration for Graduation Division augmentation fellowships plus regular central fellowship
  - HBCU faculty invitation to serve on dissertation committee
  - Mentorship provided by CABE (Council for the Advancement of Black Engineers)

Enrollments

Major	AY 14-15 Graduates	Incoming		F'15 Enrolled
		FR	TR	
Bioengineering	67	49	22	376
Business Informatics	4	37	2	67
Chemical Engineering	63	41	28	370
Computer Engineering	5	64	9	259
Computer Science	86	49	30	439
Electrical Engineering	59	75	19	352
Environmental Engineering	33	37	7	154
Materials Science & Engr.	8	14	9	77
Mechanical Engineering	121	78	30	587
Total	**446**	**445**	**155**	**2681**

AIS Distribution, F'15
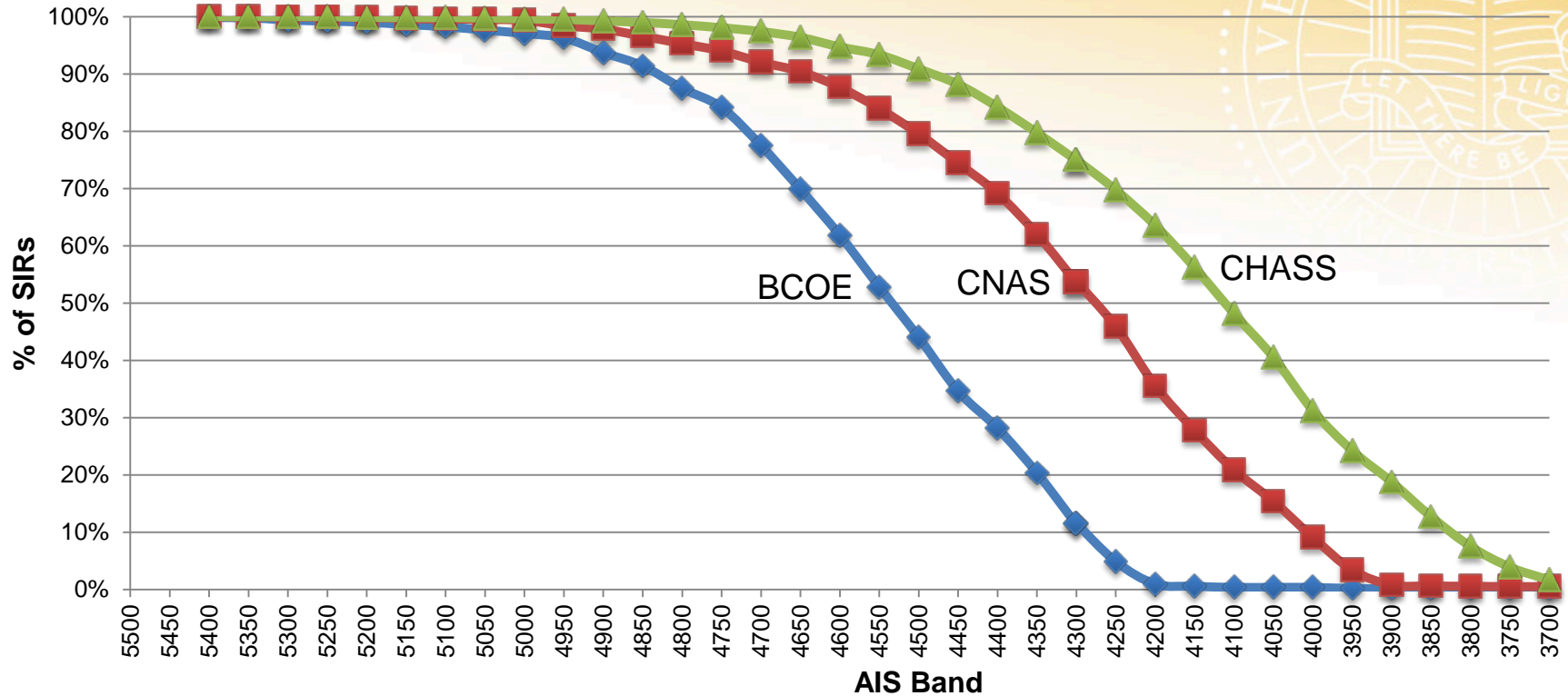
College	Median	% BCOE above
BCOE	4529	50%
CNAS	4277	92%
CHASS	4113	100%

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BCOE's AIS Improvements

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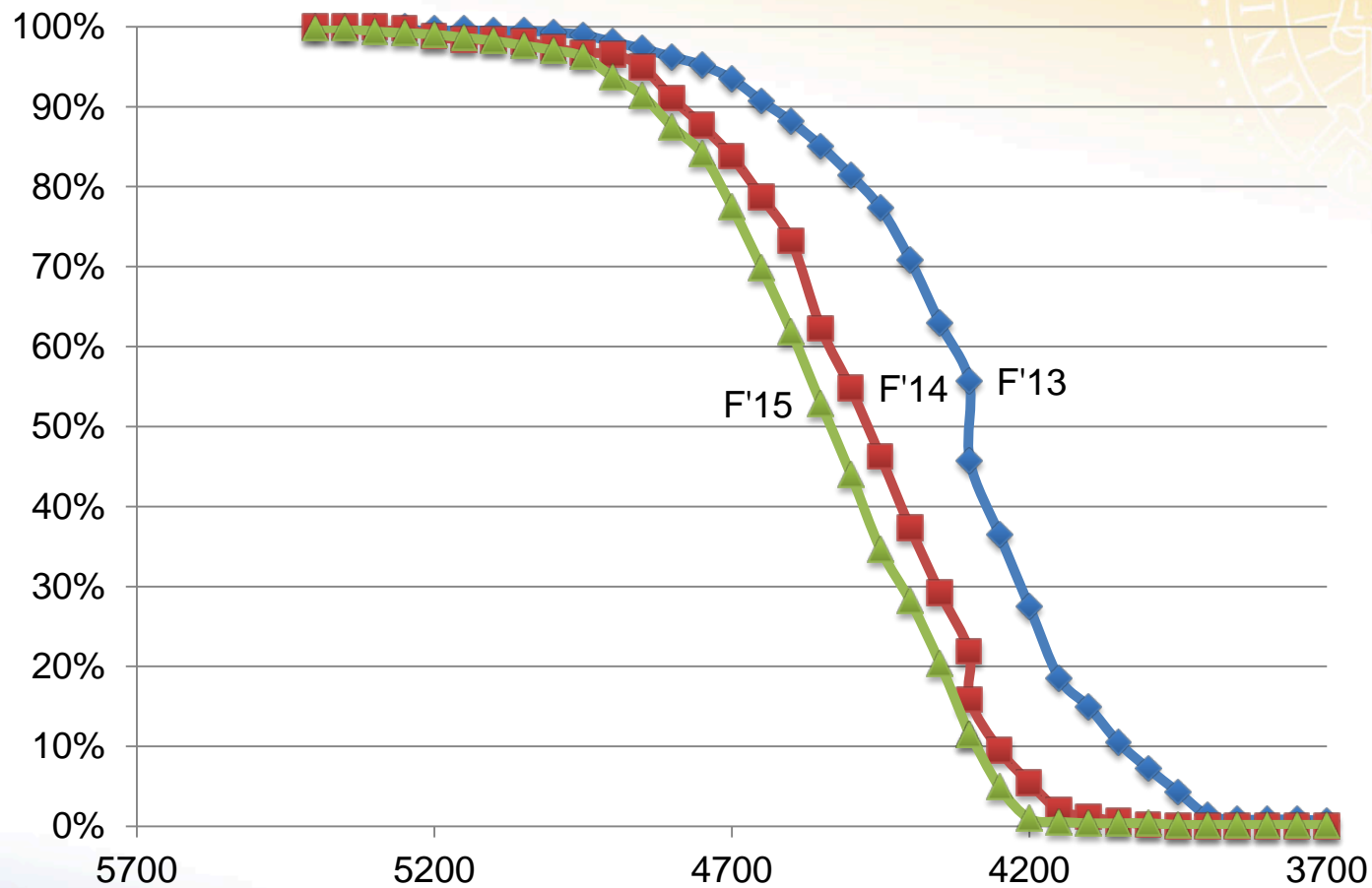
Student Development

- Professional Development
  - 23 professional student organizations (50.4% of total undergraduates)
  - 130 career development events (information sessions, resume & interview workshop, company visits, etc.)
  - 200+ student organization meetings & social events

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Student Development

- Undergraduate Research
  - 97 students funded by College's Grant from Dept. of Education
  - 152 paid positions in 2014-2015
  - 25.3% undergraduates are conducting research in lab
  - 54% undergraduates gets at least one faculty mentored undergraduate research experience before graduation

Student Development

- Outreach (K-12 & Community Colleges)
  - 41 events at local community colleges
  - Wind Turbine competition with 8 community colleges
  - 113 K-12 Outreach Events hosted by Faculty & Student Orgs
  - <u>57.95% of all UCR K-12 outreach events!</u>

BCOE Laptop Requirement

- In place for one year. Going very well.
- Students have access to lots of software

Ansys	LabVIEW System Design Software
ArcGIS	LockDown Browser
CADENCE	Mathematica
CHEMKIN-PRO	MathWorks MATLAB
COMSOL Multiphysics	Microsoft Office 365 Pro Plus
DYNSIM	Microsoft Visual Studios
IBM SPSS	PRO/II Process Stimulation
JMP	SAS (Statistical Analysis System)
	SolidWorks: 3D CAD Design

Student Professional Development

- **23 student professional organizations**
- Very active, with 1075 members (50% of BCOE students)

RESEARCH

Bourns College of Engineering

Summary Expenditures by Source
(FY 2013-14)
Total $51.8M

Tuition Fees & Other 1%

Indirect Cost 1%

Gifts 2.8%

Initial Comp 5%

S&S 7%

Contract & Grants 31.9%

General Funds 50.3%
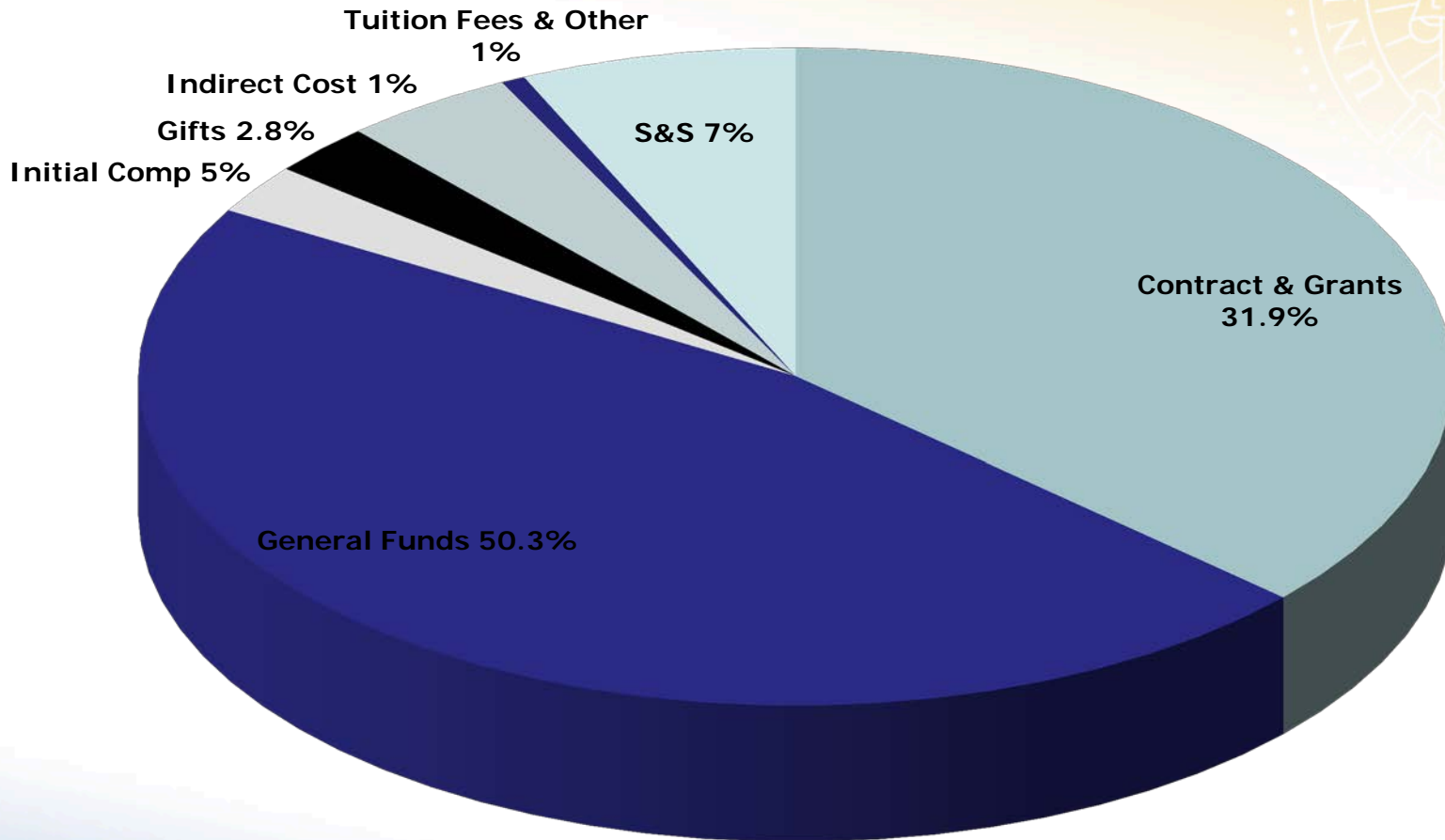
Total IDC Generated: $4.8M

UCR

Bourns College of Engineering
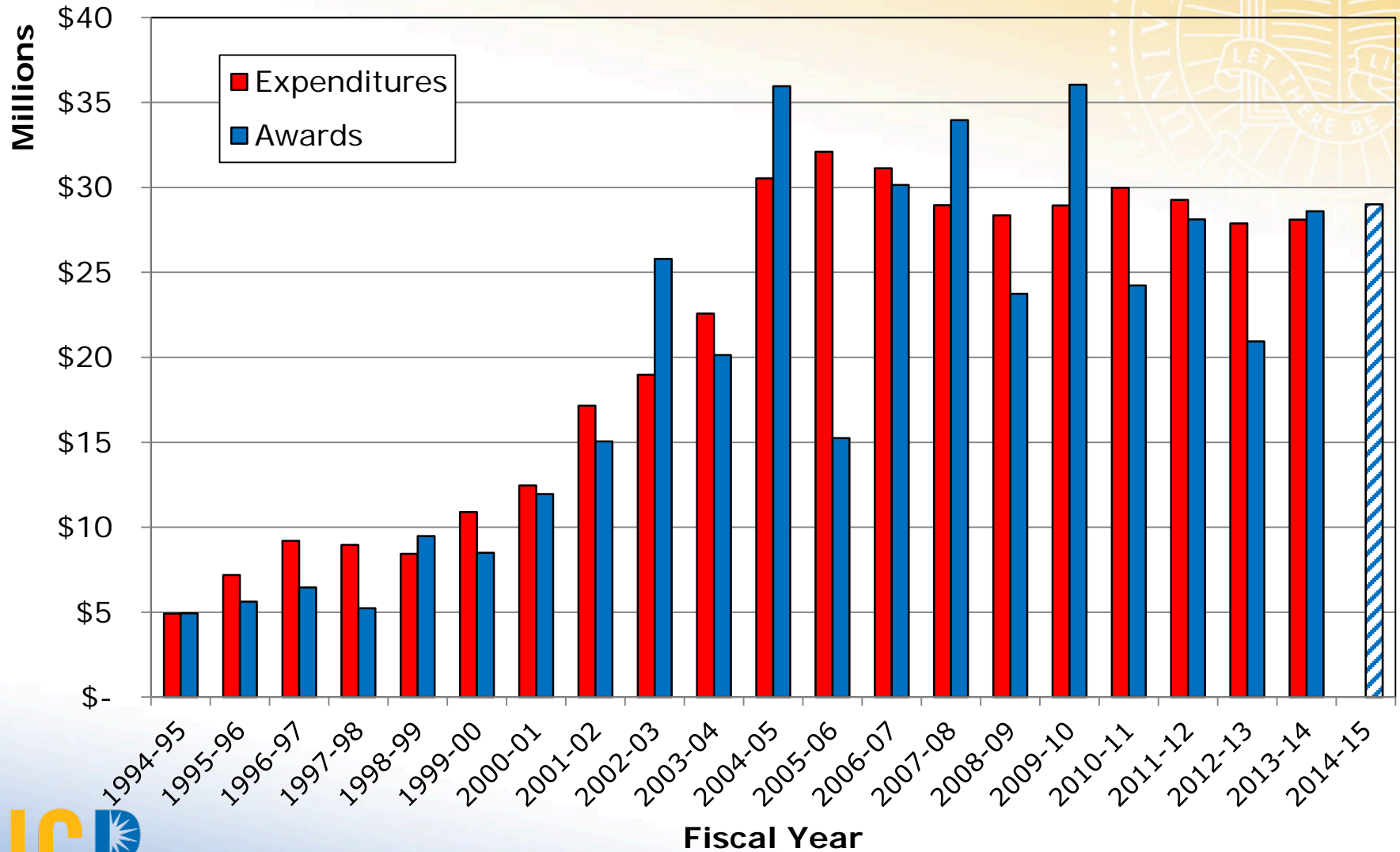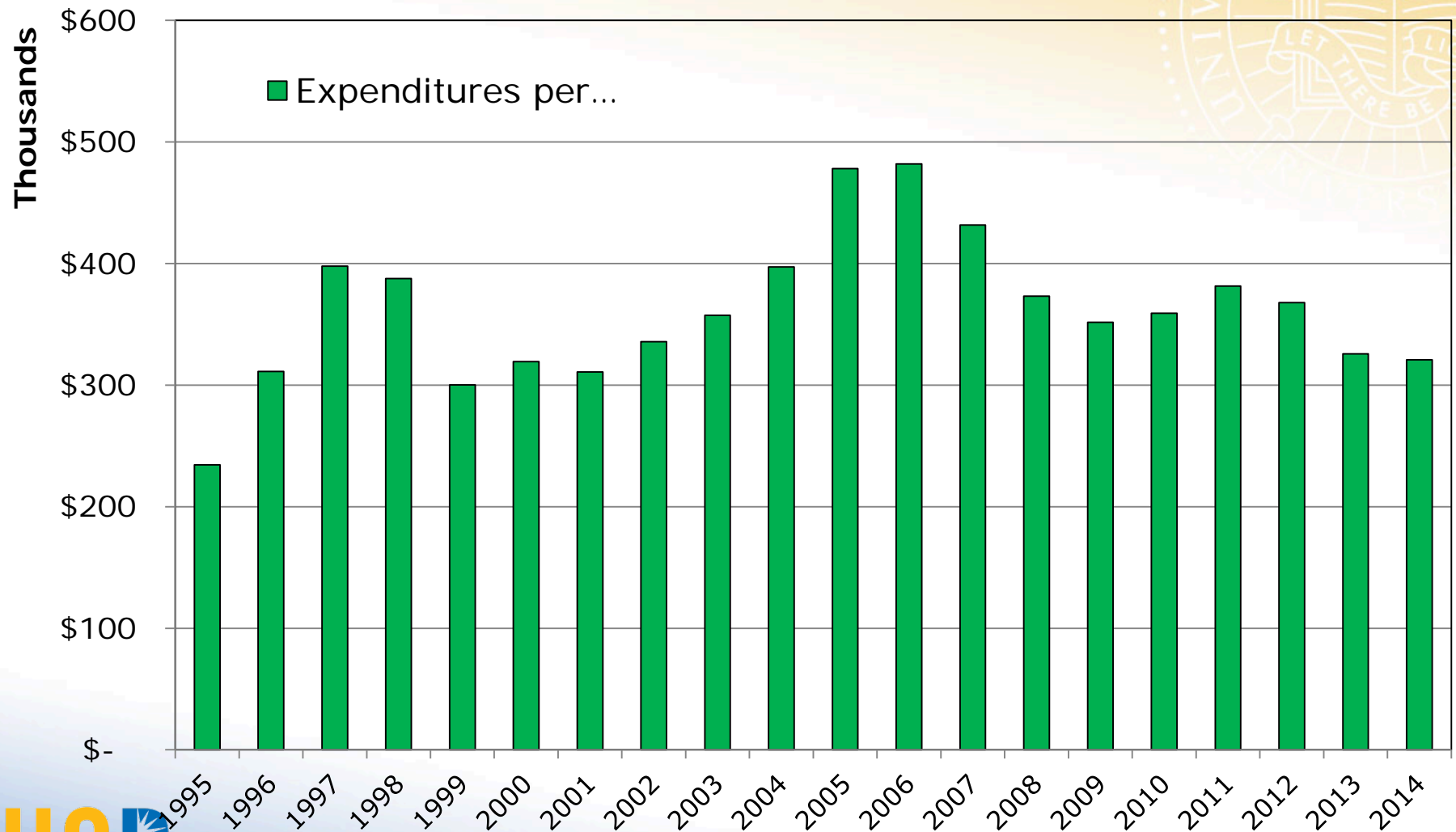
Research Activity – 15AY

- **Awards by Unit** (as of June 9, 2015)
  - BIEN: $ 923,528
  - CE-CERT: $5,450,923
  - CEE: $8,313,632
  - CSE: $4,013,297
  - CNSE: $ 302,000
  - CRIS: $ 300,000
  - ECE: $6,266,194
  - Dean's Office: $1,006,019
  - MSE: $ 169,283
  - ME: $2,336,209
  - BCOE: $24,989,957

Bourns College of Engineering

Center for Environmental Research Technology (CE-CERT)

Matthew Barth
Yeager Families Professor, Department of Electrical and Computer Engineering Director, Center for Environmental Research and Technology
CE-CERT's mission is to contribute to improved environmental quality and energy efficiency by conducting a broad program of interdisciplinary basic and applied research and by providing educational opportunities for the next generation of engineers, scientists and policy-makers.

CE-CERT Snapshot

- 25 Academic and Research Faculty, 22 staff, 55 graduate students and 60 undergraduates
- Multiple engineering disciplines: Chemical, Environmental, Mechanical, Electrical, Computer Science, Materials Science

- $12 million per year in active projects (industry, state, & federal agencies)
- ~100 industry partners
- ~40 academic partners

CE-CERT Research Areas

Emissions from Advanced Technologies and Fuels
Emissions measurement/analysis, fuel effects, new instrumentation/methods, after-treatment

Transportation Systems Research
Intelligent Transportation Systems, vehicle activity, energy/emissions modeling

Atmospheric Processes Research
secondary pollutant formation, mitigation methods, environmental modeling

Sustainable Energy Research
cellulosic ethanol, synthetic diesel fuel, energy distribution

**Southern California Research Initiative for Solar Energy, Energy Storage and Grid Integration Research**
solar devices, solar thermal, smartgrid, energy storage

www.cert.ucr.edu

AQMD Sustainable Transportation "New Grid" Project

- $2-million grant from South Coast Air Quality Management District

- 500-kilowatt photovoltaic solar installation at CE-CERT and Bourns, Inc.

- 1.1-megawatt rare earth lithium battery storage facility

- Electric vehicle charging stations at CE-CERT and in Riverside

- Conversion of trolley from diesel to electric power

- Groundbreaking in fall 2013
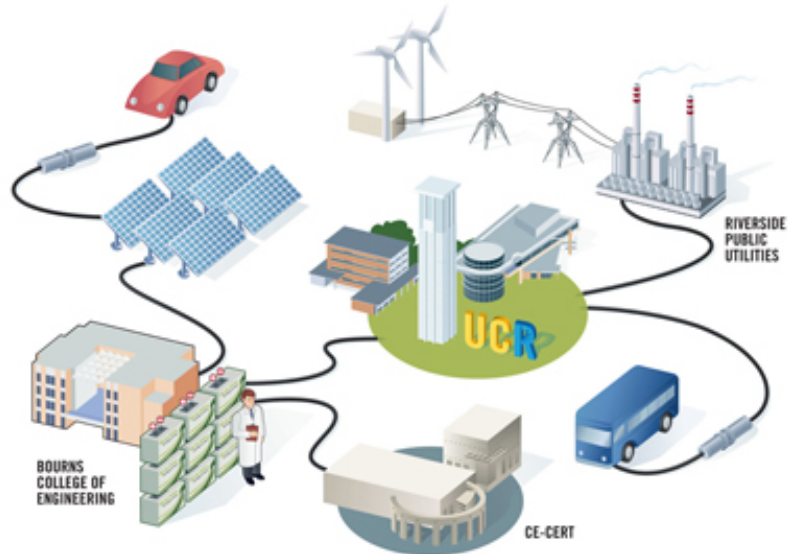
Recent Progress with the Sustainable Integrated Grid Initiative
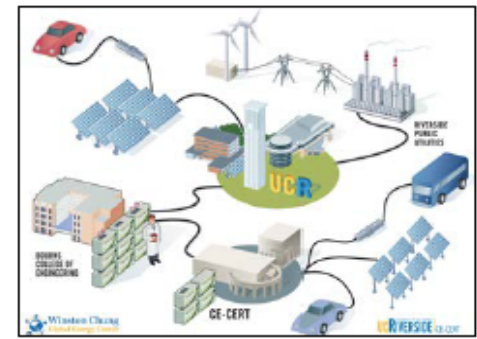
- **California Energy Commission (1):** $3 million CEC EPIC funded project on electrical efficiency improvements of the water systems of California

- **California Energy Commission (2):** $2.6 million project funded by CEC EPIC program on clean energy solutions that support California's industries, the environment, and the electrical grid (SC-RISE)

- **Southern California Edison SONGS funding:** $675K for two projects to support Vehicle to Grid research, and energy storage valuation

- **South Coast Air Quality Management District:** V2G funding coming soon

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BCOE's Growth & Critical Space Needs

- **The Chancellor's Vision:**
  - Increase UCR's faculty by 300 ladder-ranked positions.
- **A February 2013 preliminary report by UCR Capital Programs**
  - BCOE is currently in need of approximately 10,000 to12,000 ft2 of wet labs space.
- **BCOE's space shortage will become more acute with the addition of new faculty members (Limiting lab space to the new faculty to 600 ft2—No hoods available)**

Solutions

- EBU III;
- Additional building for CE-CERT
- Campus-wide MRB
- Renovation

Engr IV

Engr III

MSE

Bourns A & B

WCH

Surge

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Plans for EBU III

- Critical to BCOE's growth:
    - EBU III;
    - Additional building for CE-CERT
    - Campus-wide MRB

- The Detailed Project Program (DPP) for Engineering Building Unit III (EBU III) was completed in August, 2006.
    - EBU III includes 27,200 ft2 of research wet labs and 6,400 asf of core support facilities.
    - It is unclear when the funding will be available.

- **SOLUTION**
    - The college is looking for public/private/partnership (PPP) to raise funding for EBU III and a new building for CE-CERT

Bourns College of Engineering

CE-CERT Space Needs

- Currently CE-CERT is gaining 1-2 faculty a year and additional students and staff in proportion to this growth.

  - Additional office and laboratory space will continue to be needed.

  - Thanks to Bourns, Inc., CE-CERT has the unique ability to lease incremental space to grow its laboratories
    - 2,500 ft2 of space added using this method in the last 2 years.

- Expansion is now limited, and we need to look at other opportunities for growing CE-CERT.

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Bourns B Wet Lab Renovation Project
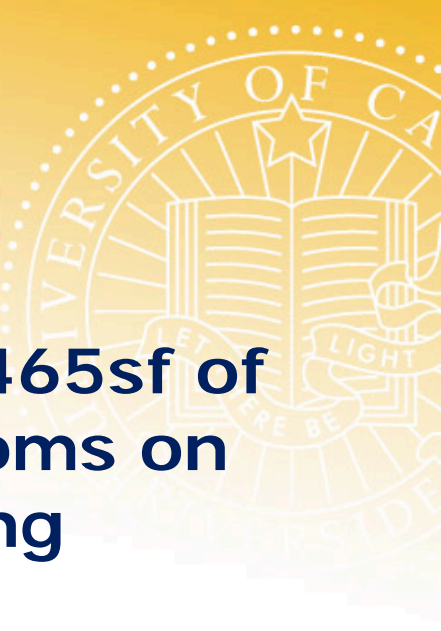
- **Project will create or enhance 23,465sf of wet lab space incorporating 17 rooms on the 2nd floor of Bourns B for existing faculty and new hires.**

- **UCR is providing $10M for this project**

- **Construction is planned to start in Spring 2016 and be completed by the end of 2016.**

Bourns College of Engineering

Thank you