# The UVI Physics Degree

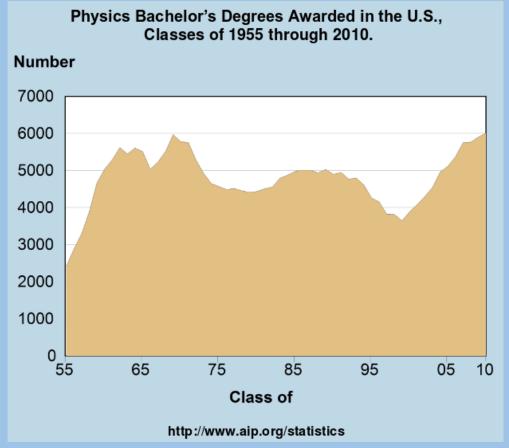
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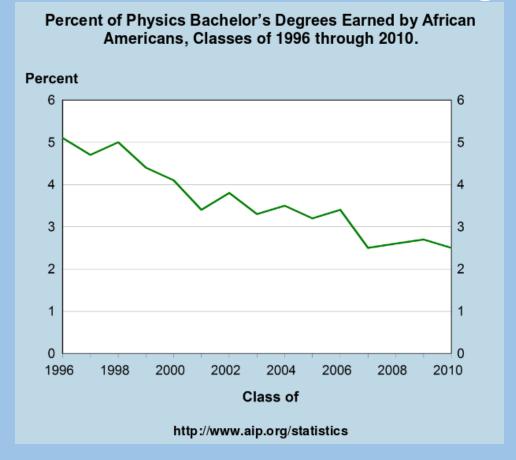
UVI BOT ARSA Meeting, Oct 7, 2016

#### The National Environment in Physics

 The number of physics degrees in the US is at its highest level

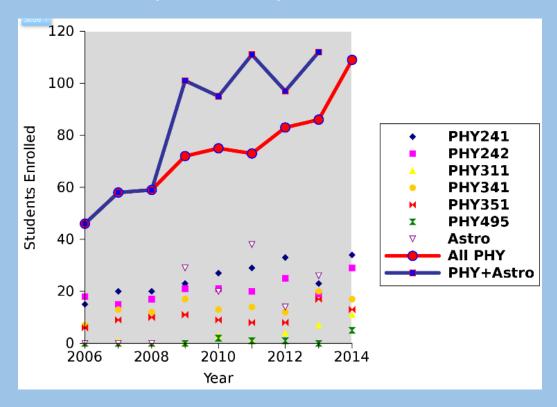


 But physics degrees earned by underserved students is falling

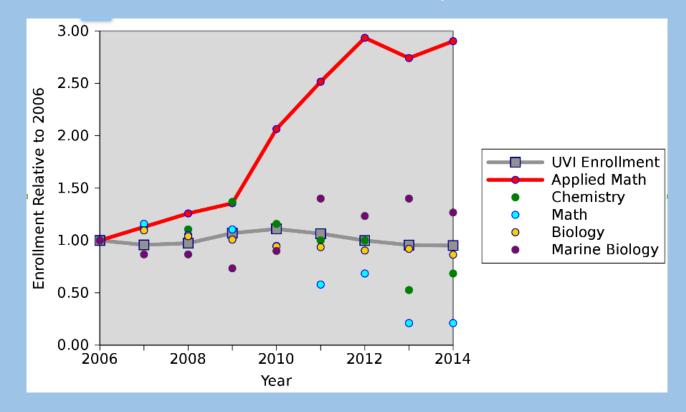


# The Need For Physics At UVI

• UVI's enrollment in physics courses has increased 143% in the past 10 years.



 Applied Math has seen an increase in enrollment of 190% in the same period



## Physics Student Work At UVI

- Since 2012, 23 individual UVI students have completed 40 academic year and summer research projects in physics without a B.S. degree available
  - Dwayne Thompson
  - Stanley Barbel
  - Sharone Richards
  - Shakim Cooper
  - Leo Jobsis
  - Arianne Ramsundahr
  - Ruel Mitchel
  - Jamar Liburd
  - Rafael Almonte
  - Omani Tuitt
  - Ykeshia Zamore

- Jose Martinez
- Ingrid Berry
- Bonnie President
- Odelmo Joseph
- Rodney Querrard
- Jason Baron
- Jared Hanley
- Kyrelle Thomas
- Ulric Baptiste
- Alexander Fortenberry
- Quianah Joyce
- Markeith Cornwall

## The Physics B.S. at UVI

UVI will be the first HBCU of its size to offer a B.S. in physics

- Opportunity for partnership with other HBCUs without physics
- Federal funding support

Expected class size at UVI of 3-6 students per year

- Comparable to chemistry
- Can be augmented by advertising at other HBCUs without physics degrees (Langston)

#### Physics Degree Structure

- Students follow applied mathematics paradigm until Sophomore year
- Leverages existing research facilities (Etelman Observatory and X-ray detector laboratory) and previous federal funding (NASA-EPSCoR, NSF HBCU-UP)

Freshman Ye	ar; First Semester	Freshman Ye	ar; Second Semester
Course	Credits	Course	Credits
FDS 100	1	CSC 117	4
SCI 100	3	SSC 100	3
CHE 151	5	CHE 152	5
MAT 143	4	MAT 153	4
COM 119	3	PED	0.5
PED	0.5		
Total	16.5	Total	16.5
Sophomore Y	ear; First Semester	Sophomore Y	ear; Second Semeste
Course	Credits	Course	Credits
CSC 239	2	PHY241	5
MAT 241	4	PHY 271	3
MAT 261	4	MAT 242	3
ENG 120	3	SS elective	3 3
ECO 221	3	HUM elective	3
PED	0.5		
Total	16.5	Total	17
	<b>'</b>		

First Semester		Junior Year;	Second Semester
Credits		Course	Credits
5		PHY341	3
3		PHY351	1
0.5		PHY 398	0.5
3		MAT 342	3
3		MAT 346	4
1		PHY 495/6	1
0.5		HUM elective	3
		PHY 4xx	2
16		Total	17.5
First Semester		Senior Year;	Second Semester
Credits		Course	Credits
3		PHY 4xx	3
3		PHY 4xx	2
0.5		PHY 498	0.5
1		MAT 325	3
3		PHY 495/6	1
3		HUM elective	3
3		Science elec	3
16.5		Total	15.5
	Credits  5 3 0.5 3 1 0.5 16 -irst Semester Credits 3 0.5 1 3 3 3 3 3 3 3 3 3 3 3	Credits  5 3 0.5 3 1 0.5 3 1 0.5 16 -irst Semester Credits 3 0.5 1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	Credits         Course           5         PHY341           3         PHY351           0.5         PHY 398           3         MAT 342           4         MAT 346           1         PHY 495/6           1         HUM elective           PHY 4xx         PHY 4xx           3         PHY 4xx           3         PHY 4xx           9         PHY 498           1         MAT 325           3         PHY 495/6           3         HUM elective           3         Science elect

Authentic research activities in PHY495/6 are essential component of degree paradigm

# Funding Sources

- NASA EPSCoR (2013-2017)
  - "Development of the VI Center for Space Science at Etelman Observatory"
  - First 'resident astronomer' hire
  - First UVI NASA summer interns
  - \$750,000
- NASA EPSCoR RID (rolling)
  - "NASA EPSCoR in the VI"
  - Support seed grants to broaden UVI participation in NASA science
  - \$125,000/yr
- NASA MUREP-MIRO (2016-2020)
  - "The First 4-Year Physics and Astronomy Degree at the University of the Virgin Islands"
  - Two new faculty to teach physics B.S.
  - Support of research infrastructure and students
  - \$2,700,000



#### Long-term Implementation Plan

To sustain a BS degree in physics without federal funding UVI can:

- Use 3 physics faculty, a reduction in gen-ed load, and student teaching assistants to stretch faculty teaching load to cover courses required for the BS degree
- Explore cross-campus hybrid service courses to leverage Title III funded physics faculty on St. Croix

To sustain a BS degree in physics after NASA-MIRO UVI can:

- Explore adding joint-appointment faculty with the requirement that such faculty self-fund part of their appointment with external federally funded grant support
- Continue to aggressively seek partnering opportunities, private donations (Teddy Gimenez Physics Fellowship), and federal funding opportunities

## Physics at UVI

UVI strategic plan goals addressed:

- 1A Increase faculty productivity and effectiveness by expanding research and faculty scholarship expectations and opportunities.
- 1B Increase the number of academic programs at the graduate and undergraduate levels.
- 1C Complete the integration of teaching, research, library, and extension faculty in order to broaden students' exposure in learning, outreach, and research.
- 1L Become a University that uses its location and areas of expertise to its advantage
- 2C Attract more high-achieving students to the University
- 3J Improve the image of the University by highlighting the achievement of students and the expertise of faculty and staff
- 6F Increase the number and dollar value of federal, corporate, and industry grants awarded to the University