250 years

of

PHYSICS AT THE COLLEGE OF WILLIAM AND MARY

1760-2010
Thanks:

Keith Griffioen (for getting me into this)
John McKnight (colonial period)
John Kane (1960s)
Franz Gross (1980s)
Jack Willis (English department)
Pat Winter

... 

and the rest of the department for feeding me facts, figures, and photos.
Physics at William and Mary in five dates

1693  Foundation of the College

1760  Jefferson meets Small

1960's Wm Small Physics Lab

1980's Jefferson Lab

2010  Prospect
Mary and William

Christopher Wren Building

1693

(Harvard 1636)
#1 Surveyor’s license

#3 Jefferson

#5 Monroe

#10 Tyler
Honorary degrees

Ben (A.M. 1756)  Jon (M.A. 2004)
Phi Beta Kappa 1776

Public University 1906

Coeducation 1918
U.S. News: W&M Top Small Public University ... Again!

Each William and Mary fall finds freshmen settling into a new home and the College taking its familiar place atop the rankings of American colleges and universities. According to the U.S. News & World Report, this year is no different: the publication ranks William and Mary the best small public university in the nation for the second year in a row.
1760

Wm SMALL meets TOM JEFFERSON
“It was my great good fortune, and what probably fixed the destinies of my life, that Dr. William Small of Scotland was then professor of mathematics, a man profound in most of the useful branches of science, with a happy talent of communication, correct and gentlemanly manners, and an enlarged and liberal mind. He, most happily for me, became soon attached to me, and made me his daily companion when not engaged in the school; and from his conversation I got my first views of the expansion of science, and of the system of things in which we are placed…”

Thomas Jefferson
“Dr. Small was ... to me as a father. To his enlightened and affectionate guidance of my studies while at college, I am indebted for everything.... He procured for me the patronage of Mr. Wythe, and both of them, the attention of Governor Fauquier.... At their frequent dinners with the governor.... I have heard more good sense, more rational and philosophical conversation than all my life besides.”

Thomas Jefferson
...and was the first who ever gave in that college regular lectures...
Small in Birmingham

...teacher of Thomas Jefferson and a founder of the Lunar Society...
Orrery
or
Mechanical Planetarium
Air Pump
Small was the Professor of Mathematics. A Major curriculum reform under governor Jefferson establishes a chair of "Natural Philosophy and Mathematics".
1960’s

The Logic of Inflation

- Human Space Flight is planned (Sputnik 1957)
- NASA-Langley Research Center builds the Space Radiation Effects Laboratory (SREL)
- Copies 600 MeV CERN Synchrocyclotron
- The accelerator can be used part-time for PHYSICS
- Nuclear physicists want university affiliations (UVa, Tech)
- William and Mary has the advantage of propinquity
- The Ph.D. program is established
- W&M professor Robert Siegel becomes Director of SREL
President Paschall seizes the opportunity
Inflation!
...Small was to me as a father...

Rolf Winter
(1928-1992)
THE DEPARTMENT IN THE SEVENTIES

Plasma: experiment & theory
Solid State: “
Atomic & Molecular: “
Nuclear & Particle: “

* Medium Energy Physics
* Exotic Atoms
  * electronic
  * muonic
  * pionic
  * antiprotonic
  * sigma minus
* Rare decays
First Observation of the Rare Decay Mode $K^0_{\text{long}} \rightarrow e^+e^-$

The number of decays of this type is one in $10^{11}$ of all decays.

“This result represents by far the smallest branching fraction yet measured in particle physics.” (1998)

“Only” 33 authors from 5 universities on the paper reporting the Brookhaven experiment.
The National Science Foundation announces a new program called REU (Research Experiences for Undergraduates).

William and Mary is one of the first participants in the country, and has continued to offer REU every year since then.
1980

SREL becomes obsolete and is replaced by CEBAF, which is renamed JEFFERSON LAB

<Early History of JLab 2009.ppt> by Franz Gross
W&M in running for accelerator funding

Daily Press

Universities Seek
To Wrench Lab
From Peninsula

Political battle
over accelerator
takes new turn

Hopewell News
Hopewell, VA.
JUL 21 1983

Nuclear research advancements falls to ‘amateurs’
Existing in 1980

VARC
Virginia Associated Research Campus
&
SREL
Space Radiation Effects Laboratory

CEBAF
Continuous Electron Beam Accelerator
J. Dirk Walecka

• Joined Stanford faculty 1960

• Stanford chair 1977-82

• CEBAF Scientific Director 1986-92

• W&M chair 1994-2000

plus many experiments, many faculty members, many papers, many Ph.D.s and many undergraduates
Jefferson Lab 12 GeV Upgrade scheduled for 2014
Lessons Learned

* Provincial v. Metropolitan
  (amateur v. professional, underdog v. favorite, outsider v. establishment)
  **Cultivate self-confidence (but not hubris)**

* Mentoring
  (father-figure)
  **Care for your students**

* Serendipity
  (SREL, Jlab, REU, Olympiad...)
  **Say YES to unanticipated opportunities**

* Balance
  **Value fairness, democracy, and collegiality over unbridled academic competition**
Thank you, William & Mary physics department, for four decades of friendship and support!