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May 9, 2017
History Keepers Program

The Legacy of Black Physicists at Yale

As History Keepers student, I used my project as an opportunity to explore the history of Black physicists at Yale. This idea grew out of a frustration over the lack of information about any Black physicist at Yale since Edward Bouchet in 1876. Bouchet, a New Haven native, graduated from Yale College in 1874 and received his PhD in physics in 1876 – when he became the very first African American to receive a Ph.D. in the United States. After graduation, however, he could not find faculty positions teaching physics in (white) universities, and so he spent the remainder of his life teaching at schools like Philadelphia’s Institute for Colored Youth and working odd jobs.¹ Though remembering and honoring the legacy of Edward Bouchet is certainly extremely important, there have been other successful Black physicists at Yale in the past 140 years. Who were they? What did they do? What were their experiences like here? Why don't we know their names? By identifying and elevating the experiences and careers of these Black physicists, I aim to raise awareness of the long legacy of Black excellence that exists at Yale’s physics and astronomy departments.

Especially in this contemporary moment and with the recent success of the *Hidden Figures* movie, the realities of historical erasure of Black success in STEM are apparent. While *Hidden Figures* has brought this issue into the public eye, it has existed as long as the institution of science has existed. Indeed, as of 2012, the physics professoriate in the United States was 83%

¹ Elmer Samuel Imes et al., eds., *Edward Bouchet: The First African-American Doctorate* (New Jersey: World Scientific Publishing Co. Pte. Ltd, 2002), <http://site.ebrary.com/lib/yale/Doc?id=10201196>.

male and and 79% white.² I would love for my research project to hold up a mirror to the physics and astronomy departments and confront them with their own histories (and realities) of underrepresentation and erasure. In addition, the discovery of Yale's first Black physicists would place myself and those like me in a genealogical line of Black scientists, rather than reifying the isolation we currently experience in our non-diverse fields.

My research project consisted of two phases: identification and documentation. Because there is so little readily available information about Black alumni in physics, my mentor Judy Schiff and I had to think creatively to identify individuals. Originally, I attempted to find names by searching the library collection (and Google) for any information about African American physicist at Yale, and by contacting other librarians to inquire if they knew of any useful sources. Unfortunately, none of these methods proved successful. Finally, my mentor advised that I reach out to the most senior faculty in the physics and astronomy departments. Ultimately, I corresponded with Keith Baker, Pierre Demarque, Bob Zinn, Jeff Kenney, Richard Larson, Paul Tipton, Jack Harris, and Charles Bailyn. From these eight email requests, I compiled a list of five additional Black physics alumni between 1965 and 2014. The list of identified alumni, as well as some brief information about them, is included in the appendix.

Once I compiled a list of alumni, I began to document the experiences of these alumni by conducting oral histories. With the guidance of Dean Nelson, I chose to focus on a single alumnus: Dr. Joseph A. Johnson III. Dr. Johnson was born in Tennessee, graduated with a B.S. in physics from Fisk University in 1960, and completed his Ph.D. at Yale, "Pion Production and

² Rachel Ivie, Garrett Anderson, and Susan White, "African Americans & Hispanics among Physics & Astronomy Faculty," *American Institute of Physics*, July 2014.

Elastic Scattering in Antiproton-Proton Collisions at 7 Bev/C,” in 1965.³ After Yale, he went on to have an extremely successful career including faculty appointments at Yale University, Southern University, Rutgers University, The City College, and Florida A&M University. Dr. Johnson’s accolades are numerous: at Florida A&M, he became a Distinguished Professor of Science and Engineering and the Director of the NASA HBCU Research Center for Nonlinear and Non-equilibrium Aeroscience; he was also elected a fellow of both the American Institute for Aeronautics & Astronautics, the American Physical Society, and the National Society of Black Physicists.⁴ He retired from Florida A&M in 2009 and maintains Professor Emeritus status.

I had the great honor of conducting two interviews with Dr. Johnson, totaling almost 90 minutes. During our conversations, I asked him to describe the details of his career: his initial interest in physics, his acceptance to Yale’s graduate program, the subject of his Ph.D. thesis, and the culture of the physics department. Additionally, I asked him to reflect on his career after Yale, and the motivations and methods that led him to the success he experienced.

Though there was so much of interest in what he said, I was particularly intrigued by Dr. Johnson’s Yale experience. Firstly, he did not formally apply to the graduate program in physics here; rather, the department actively recruited him after a chance encounter with a faculty member during a summer at Brookhaven National Labs. He was offered a spot to study at Yale and received the Danforth Foundation fellowship to cover all tuition and fees plus a living

³ Joseph Andrew Johnson, “Pion Production and Elastic Scattering in Antiproton-Proton Collisions At 7 Bev/C,” *Dissertation Abstracts International*, 1965, http://gateway.proquest.com/openurl?url_ver=Z39.88-2004&rft_val_fmt=info:ofi/fmt:kev:mtx:dissertation&res_dat=xri:pqdiss&rft_dat=xri:pqdiss:6514675.

⁴ “Joseph A. Johnson III,” *1995 Edward A. Bouchet Award Recipient: APS Physics*, accessed May 2, 2017, http://www.aps.org/programs/honors/prizes/prizerecipient.cfm?first_nm=Joseph&last_nm=III&year=1995.

stipend - all before the December of his senior undergraduate year. He reflected on the Yale physics department as being “100% supportive, personally” throughout his five years here; he said that “the physics chairman made it very clear to me that he expected my experience to be successful... I had a general sense that things were lined up to make this happen.” He referred specifically back to two instances that exemplified this support: first, when he was given an opportunity to retake his qualifying exams after a disappointing first round, and second, when he was provided with additional funding and accommodation in order to take his wife and newborn son with him to a week at Brookhaven. He described the department and Yale community at large as being “unqualified and supportive of me and my family, personally.” When I asked him what he thought was the reason for the 90 year gap between Bouchet’s graduation and his own, his response was:

There weren’t a whole lot of candidates. When I got my Ph.D. in ‘65, I could name all of the people of African descent who had Ph.Ds. in physics in the world. In 1965, it was a very very short list... In all honesty, it wasn’t a deficiency at Yale – nobody popped up in the way that I popped up.

This response was, admittedly surprising to me; knowing the coldness of Yale’s physics department towards women and minorities today, I expected to hear that the department in the 1960s was a chilly and unwelcoming place. However, Dr. Johnson’s response reflected the effects of a deeper, more systemic problem preventing African Americans from entering physics, more than a problem within Yale alone.

As he reflected on his career after Yale, Dr. Johnson asserted that he didn’t face “any genuine obstacles,” and largely found that his determination and focus afforded him a smooth path to success in academia. He shared his learning that “the way to succeed in physics, then and

now, is to establish your own niche: something that you do that's identified with you; something that, if you succeed, it's no question that the successes are yours." As Dr. Johnson mentored 14 physics Ph.Ds over the course of his career, he certainly passed this wisdom on. Finally, I was very impressed to hear that Dr. Johnson is continuing his engagement with the physics world today, in retirement. He shared with me that he frequently reads the latest physics journals thanks to an agreement with the Florida A&M library, and that he has no intentions of slowing down; he quipped, "If I can live to be 105, then I might have to slow down." I learned much more from my conversations with Dr. Johnson than I have shared here, and I cannot adequately express how inspiring and exciting it was to learn about the life experiences and worldviews of someone so successful, dedicated, and kind.

The work that I completed this semester only scrapes the surface of the long history of Black physicists at Yale. Much work remains to be done, hopefully identifying more alumni and certainly making contact with known alumni to document the histories they embodied at Yale. While I will be graduating this May, I will pass this document onto the physics department, the astronomy department, and the Yale League of Black scientists to ensure that these names are not forgotten, and that the list will be updated and passed down so as to be available to future scholars. Additionally, I will pass the recordings and (later) transcriptions of the oral histories along to the Afro-American Cultural Center. It is past time that we acknowledge and celebrate the brave and pioneering individuals who succeeded in unfamiliar and sometimes unfriendly fields of study. I certainly hope this project might inspire future History Keepers or physics students to continuing documenting our history.

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APPENDIX: All Known Black Yale Physics & Astronomy Students

1874 - **Edward Bouchet**, PhD, Physics

- First African American to get a PhD in the United States
- Passed away in 1918

1965 - **Joseph Johnson**, PhD, Physics (Jack Harris)

- B.S. in physics from Fisk University in 1960
- Thesis: “Pion Production and Elastic Scattering in Antiproton-Proton Collisions at 7 Bev/C”
- Former professor at Yale, Southern, Rutgers, City College
- Professor Emeritus at Florida A&M University
- Published biographies and information:
 - [“Physicists of the African Diaspora”](#)
 - [American Physical Society 1995 Edward A. Bouchet Award Recipient](#)
 - [National Society of Black Physicists](#)
 - [2016 Recipient of the Yale Bouchet Medal](#)
- Contact: josephjohnson3@mac.com

1970 - **Edgar Lynk**, B.S. & Ph.D., Physics

- B.S. in physics from Yale University in 1963 (as listed in his [signature](#))
- Thesis: “Infrared Optical Excitation Functions Using Stimulated Emission Techniques”
- Contact: elynk@aya.yale.edu

1972 - **Allen Sessoms**, PhD, Physics

- B.S. in physics from Union College, 1968
- M.S in physics from University of Washington, 1969
- Thesis: “Measurement of Kaon₀ Form Factors in Neutral Kaon⁰_{μ3} Decays”
- Former President of Delaware State University
- Former President of the University of the District of Columbia
- Professor at Georgetown University of Continuing Education
- Published biographies and information:
 - [The History Makers](#)
- Contact: [LinkedIn](#)

2009 - **Greg Mosby**, B.S., Astronomy

- M.S. & Ph.D. in astronomy at the University of Wisconsin Madison, 2016
- Post-doctoral Fellow at NASA Goddard Space Flight Center
- Published biographies and information:

- [Astronomy in Color](#)
- [NASA Sciences & Exploration Directorate](#)
- Contact: gregory.mosby@nasa.gov, [LinkedIn](#)

2011 - **Victor Kipkoech Mutai**, BS, Astronomy

- From Kenya
- Senior Thesis: “Infrared and X-Ray Monitoring of the Microquasar GRS 1915+105”
- Software Engineer at LogMeIn
- Published biographies and information:
 - [Virtual CV](#)
- Contact: [LinkedIn](#)

2014 - **Jedidah Isler**, PhD, Astronomy

- B.S. in physics from Norfolk State University
- M.A. in physics from Fisk University, 2007
- Thesis: “In Like a Lamb, Out Like a Lion: Probing the Disk-Jet Connection in Fermi Gamma-ray Bright Blazars”
- Former post-doctoral fellow at Syracuse University
- Post-doctoral fellow at Vanderbilt University
- Host and producer of [#VanguardSTEM](#), “a live, monthly web-series featuring a rotating panel of women of color in STEM discussing a wide variety of topics including their research interests, wisdom, advice, tips, tricks and current events (among many other things!)”
- Published biographies and information:
 - [Personal website](#)
 - [Wikipedia](#)
 - (she is amazing and there is information about her everywhere)
- Contact: jedidah.isler@vanderbilt.edu

FORTHCOMING GRADUATES

2017 - **Lauren Chambers**, BS, Astrophysics & African American Studies

Justin Myles, BS, Physics

Eustace Edwards, PhD, Physics

2018 - **Nate Barbour**, BS, Physics

Stefan Elrington, PhD, Physics

2019 - **Osase Omoruyi**, BS, Astrophysics

Brooke Russell, PhD, Physics

Charles Brown, PhD, Physics

2020 - **Ry Walker**, BS, Astrophysics & Ethnicity, Race, and Migration

2021 - **Adrian Meyers**, PhD, Astronomy