

## Joseph Thomas Gier

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1910-1961

By Magdalene L. Crowley



When Joseph Thomas Gier was appointed associate professor of electrical engineering at UC Berkeley in 1952, he became the first tenured Black professor in the entire University of California educational system and the first tenured Black faculty member in a STEM field—and the second in any field—at a top-ranked, predominantly white university in the country (the first was W. Allison Davis, a professor of education at the University of Chicago who earned tenure in 1947).<sup>1</sup>

### Wasn't David Blackwell First?

Although many in the University now celebrate statistician David Blackwell as the first Black ladder-rank professor at Berkeley—he had a dorm named in his honor in August 2018<sup>2</sup>—Gier was still acknowledged as the first until at least 2003 when he was the subject of a quiz question printed in the General Catalog.<sup>3</sup> It is likely that Blackwell's oral history, which was also published in 2003, played a role in the confusion. In the *Interview History* at the beginning of the document, Nadine Wilmot states "When Dr. Blackwell came to UC Berkeley in 1954 after a decade at Howard University in Washington D.C., he became, we think, the first African American ladder rank faculty person systemwide."<sup>4</sup> However, in the interview itself, Blackwell states that he "wouldn't be surprised" if Gier had beaten him to it. "He was certainly here when I came. And he had some kind of faculty position, there's no doubt about that. You have to be careful when you talk about 'firsts.'"<sup>5</sup>

It would be correct to say that David Blackwell was the first Black *full* professor at UC Berkeley. Gier became a full professor in 1958.

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<sup>1</sup> "JBHE Chronology of Major Landmarks in the Progress of African Americans in Higher Education," *The Journal of Blacks in Higher Education: Key Events in Black Higher Education*. <https://www.jbhe.com/chronology/> Accessed 10/21/18

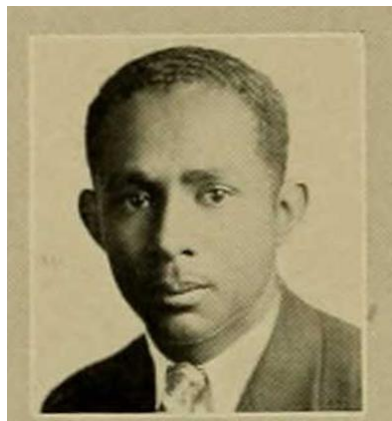
<sup>2</sup> Kane, Will "A first look inside Blackwell Hall, Berkeley's newest freshman living space," *Berkeley News*. July 31, 2018. <https://news.berkeley.edu/2018/07/31/a-first-look-inside-blackwell-hall-berkeley-s-newest-freshman-living-space/>

<sup>3</sup> "CAL Quiz," Question 27 (p.88) & Answer (p.497). 2003 U.C. Berkeley General Catalog

<sup>4</sup> "An Oral History with David Blackwell," Regional Oral History Office, The Bancroft Library (The Regents of the University of California, 2003) p. iii

<sup>5</sup> *Ibid.* p. 131

## Early History



High school yearbook photo, 1928

Joe Gier was born in New Orleans on July 2, 1910, the third child<sup>6</sup> of Joseph Thomas Sr., a porter,<sup>7</sup> and Alice Genevieve Fazende,<sup>8</sup> a dressmaker,<sup>9</sup> both from Louisiana.<sup>10</sup> His father died when he was 3 months old, and he and his sisters moved with their mother to Oakland where she took a job as a domestic.<sup>11</sup> Joe grew up in Oakland and attended Roosevelt High School<sup>12</sup> where he appears to have been an extremely well-rounded student. He was on the honor roll, participated in the Christmas pageant, sang with the Hilltop Harmonists (a “double quartette choir”<sup>13</sup>), and was selected for membership in the Alpha Gatta club which provided leadership opportunities for “students who are outstanding in scholarship and citizenship.”<sup>14</sup> He was a member of both the Social Studies and Visual Education groups, the latter of which used “burgeoning educational technologies” like stereographs and slides, to “bring the world to the pupil.”<sup>15</sup> He was the manager of the varsity baseball team, and a letterman in both baseball and basketball. Each high school senior was summed up with a quote in the yearbook, and Gier's was: “In every thought so good and kind.”<sup>16</sup>

After high school graduation in 1928, Gier worked briefly as a chauffeur and Pullman porter<sup>17</sup> before being accepted to UC Berkeley in 1930. He was elected president of the University of California Alpha Epsilon Chapter of the Alpha Phi Alpha (APA) fraternity in 1932<sup>18</sup> and lived on Twenty-first Street in

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<sup>6</sup> He had two older sisters, Alice Josephine (b. 1899) and Gladys Camelia (b. 1903). Alice married Eugene Thrash and died before the age of 30. Eugene continued to live with the Gier family for a number of years after his wife's death. Gladys became a high school teacher in El Centro and married an elementary school teacher, James Robinson. [multiple birth, marriage, and census records]

<sup>7</sup> US City Directory, 1908, New Orleans, LA

<sup>8</sup> New Orleans, Louisiana Birth Records Index, 1790-1899

<sup>9</sup> 1920 census: Census Place: New Orleans Ward 13, Orleans, Louisiana; Roll: T625\_624; Page: 11B; Enumeration District: 227

<sup>10</sup> Biographical data submitted October 10, 1957. EECs department personnel file.

<sup>11</sup> 1930 census: Census Place: Oakland, Alameda, California; Page: 19A; Enumeration District: 0177; FHL microfilm: 2339842

<sup>12</sup> Roosevelt High School is now Roosevelt Middle School. “Roosevelt Middle School,” The Living New Deal.

<https://livingnewdeal.org/projects/roosevelt-middle-school-oakland-ca/> accessed 12/26/21

<sup>13</sup> Oakland Tribune, 30-Jan-1928, p.B- 5, “PTA News”

<sup>14</sup> Oakland Tribune, 19-Aug-30, p. C-18, “Today in the High Schools”

<sup>15</sup> Day Good, Katie “Sight-Seeing in School: Visual Technology, Virtual Experience, and World Citizenship in American Education, 1900–1930” [https://www.researchgate.net/publication/332157698\\_Sight-Seeing\\_in\\_School\\_Visual\\_Technology\\_Virtual\\_Experience\\_and\\_World\\_Citizenship\\_in\\_American\\_Education\\_1900-1930](https://www.researchgate.net/publication/332157698_Sight-Seeing_in_School_Visual_Technology_Virtual_Experience_and_World_Citizenship_in_American_Education_1900-1930)

[https://www.researchgate.net/publication/332157698\\_Sight-Seeing\\_in\\_School\\_Visual\\_Technology\\_Virtual\\_Experience\\_and\\_World\\_Citizenship\\_in\\_American\\_Education\\_1900-1930](https://www.researchgate.net/publication/332157698_Sight-Seeing_in_School_Visual_Technology_Virtual_Experience_and_World_Citizenship_in_American_Education_1900-1930) accessed 11/9/21

<sup>16</sup> The Lariat, Roosevelt High School yearbook, 1928 p. 24

<sup>17</sup> Reasons and Patrick, J. T. Gier: They had a dream – The Chronicle Telegram (Elyria Ohio) – July 25, 1971, p. 51

<https://newspaperarchive.com/elyria-chronicle-telegram-jul-25-1971-p-51/> accessed 10/17/18

<sup>18</sup> “Chapters,” The Sphinx, Spring, February 1932, Vol. 18, No. 1 19320180. p. 1.

<https://issuu.com/apa1906network/docs/193201801> Accessed 10/18/18

Oakland.<sup>19</sup> He earned his Bachelor of Science degree in Mechanical Engineering (ME) in 1933<sup>20</sup> and is thought to be the first Black student to earn a B.S. in ME from Berkeley.<sup>21</sup>

When Gier graduated from college, he looked for work as an engineer but could only find employment as a designing draftsman for the Alameda High School system and as an “estimator and layout man” for Dempsey Electrical, a private contractor.<sup>22</sup> So, he returned to Berkeley in 1937 as a laboratory assistant and earned his Master’s degree in Engineering in 1940.

Gier stayed involved with APA and was elected chairman of the Chapter Program Committee in 1941.<sup>23</sup> He married Kathryn Beatrice Catley of Los Angeles in 1939 and they had two sons, Ronald Joseph and Keith Donald.

## Gier Dunkle Instruments

Gier formed a professional partnership with ME Prof. Robert Valentine Dunkle in 1943. He and Dunkle helped define the basic concept of the use of spectral selectivity for the efficient photothermal conversion of solar radiation,<sup>24</sup> and they became world experts in the field of thermal and luminous radiation. Associates considered Gier’s reports on thermal radiation “basic references in the field,” and his “method of measurement of reflectivity and emissivity over the complete range from 1.0 to 23 microns” became recognized as a standard method.<sup>25</sup> It is notable that, although Dunkle was described by former Berkeley Chancellor and ME professor Chang-Lin Tien as “a famous radiation professor,”<sup>26</sup> Gier’s name appears first on their joint inventions. They started a business together to produce their instruments<sup>27</sup> and appear to have been good friends outside of work.<sup>28</sup>

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<sup>19</sup> Register of the University of California, 1928-29 v.2, p. 197

<sup>20</sup> Register of the University of California, 1933-34 v.2, p. 230

<sup>21</sup> Humphreys, Sheila. As yet untitled, unpublished monograph on Diversity in Engineering at Berkeley. 21-jun-2019

<sup>22</sup> He was a designing draftsman for the “Voc. Educ. Dept., Alameda High, Alameda (Mr. C. W. Cox)” in 1935 and an “estimator and layout man” for “Dempsey Electrical Contractor, 16th and San Pablo, Oakland” in 1936. Departmental bio-bibliography, 17-Oct-1952 – Revised

<sup>23</sup> “Alpha Epsilon Chapter University of California,” *The Sphinx*, Spring, May 1941, Vol. 27, No. 4 194102704. p. 20.  
<https://issuu.com/apa1906network/docs/194102704/22> Accessed 10/18/18

<sup>24</sup> Buhrman, R. A. “Physics of Solar Selective Surfaces,” *Advances in Solar Energy* p. 207  
[https://link.springer.com/chapter/10.1007/978-1-4613-2227-6\\_4](https://link.springer.com/chapter/10.1007/978-1-4613-2227-6_4) Accessed 10/18/19

<sup>25</sup> Boelter, L. M. K., Edwards, D. K., Grandi, L. L., Taylor, E. H., Joseph Thomas Gier, *Engineering: Los Angeles and Berkeley obituary* (University of California: In Memoriam, 1963).  
<https://oac.cdlib.org/view?docId=hb0580022s;NAAN=13030&doc.view=frames&chunk.id=div00010&toc.depth=1&toc.id=&brand=oac4> accessed 10/17/18

<sup>26</sup> Nathan, Harriet, “Moving to Radiation; Assistant Professor, 1960,” Chang-Lin Tien *Four Decades of Distinguished Service*, University History Series Interviews Conducted by Harriet Nathan 1997-1999, p.52 (Regional Oral History Office University of California, The Bancroft Library Berkeley, California. © 2004 by The Regents of the University of California)  
[http://digitalassets.lib.berkeley.edu/roho/ucb/text/tien\\_chang-lin.pdf](http://digitalassets.lib.berkeley.edu/roho/ucb/text/tien_chang-lin.pdf) Accessed 10/18/18

<sup>27</sup> Gier Dunkle Instruments appears to have been incorporated on March 30, 1984 (<https://www.cacompanydir.com/companies/gier-dunkle-instruments-inc/>) and dissolved on January 14, 1999 (“Gier Dunkle Instruments, Inc., number: C1303179, status: dissolved, last statement: 1/14/1999, principal address: 4204 Miraleste Dr., Rancho Palos Verdes, CA 90275, agent name: Keith E. Nelson.” California Company Directory. <https://california-company.com/co/gier-dunkle-instruments-inc/>) Accessed 05-jan-2019

<sup>28</sup> When they drove to a conference in Seattle, they shared a rental car instead of using a University-owned vehicle so they would be free to “drive to different points of interest on the trip.” Gier, Joseph T., Automobile Permit form, 24-Jun-1954

Gier was listed on eight patents filed between 1948 and 1960, six of which listed him as the primary contributor.<sup>29</sup> Five of these instruments were co-created by Gier and Dunkle including: the Gier Dunkle Total Hemispherical Radiometer, which remained in widespread use for years throughout the world by scientists studying heat balances and heat transfer problems;<sup>30</sup> the Gier Dunkle Infrared Reflectometer, which is still in use today because of its relative speed and accuracy;<sup>31</sup> and the Gier Dunkle Black Body Reflectometer, which became standard equipment in America's space laboratories where it was used to help select materials which could withstand the searing heat of the sun in outer space.<sup>32</sup> Light and portable, the Black Body Reflectometer was often operated directly on a standing spacecraft for periodic preflight monitoring of coatings' properties.<sup>33</sup> It was also used to design equipment to harness solar energy on Earth.<sup>34</sup> Gier's inventions all generated revenue for UC Berkeley.<sup>35</sup>

Dunkle, who was a Quaker, left the university for Australia in 1959 because he did not want his research used for military purposes.<sup>36</sup>

## Career at Berkeley

Gier began his career at Berkeley in 1939 as a lab technician for the California Highway Patrol Illumination Laboratory,<sup>37</sup> a UC research project that functioned as the agency which tested headlights, taillights, and signaling devices for the State of California Division of Motor Vehicles.<sup>38</sup> He was promoted to Chief Engineer just two years later to fill the seat vacated by his mentor, the Associate Dean of Engineering Llewellyn Michael Kraus Boelter, who left Berkeley to found the College of Engineering at the University of California, Los Angeles (UCLA).<sup>39</sup>

Gier was hired as a half-time lecturer in the EE Division in 1946 and was considered by many to be "the best laboratory instructor ever to teach in electrical engineering at Berkeley." "He did not try to dazzle his students with his erudition;" his colleagues said, "his goal was always imparting understanding."<sup>40</sup> He

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<sup>29</sup> Google patents for gier, joseph. <https://patents.google.com/?inventor=gier%2c+joseph&oq=gier%2c+joseph> Accessed 2/14/19

<sup>30</sup> Op. cit. Reasons & Patrick, J.T. Gier

<sup>31</sup> Prof. Michael Collins at the University of Waterloo says that he is "regularly approached to do measurements using the DB-100 because (A) there are very few of these devices left in operation, and (B) it is fast, accurate, and still a valid ASTM measurement." Collins said the MS-251 Solar Reflectometer was still an inexpensive option to the more accurate UV-VIS-NIR spectrophotometer until 2002, when the price of the latter went down.

<https://eecs.berkeley.edu/about/history/gier/instruments> (based on personal correspondence from Michael Collins to Magdalene Crowley on February 18, 2019)

<sup>32</sup> Ibid.

<sup>33</sup> Karam, Robert D., "Satellite Thermal Control for Systems Engineers." Progress in Astronautics and Aeronautics Chapter 3, Sec. IV.C (Paul Zarchan Editor-in-Chief, Volume 181) P. 62

<sup>34</sup> Op. cit. Reasons & Patrick, J.T. Gier

<sup>35</sup> D.M. Finch, letter to John Whinnery 3-Oct-1957

<sup>36</sup> Op. cit. Tien, Chang-Lin oral history

<sup>37</sup> The CHP Illumination Lab appears to have been supported by government funds to find ways to improve public safety.

<sup>38</sup> Op cit. EECS biographical data, 1957

<sup>39</sup> Maslach, George J., Warren, Stafford L., McCutchan, Joseph W., "Llewellyn Michael Kraus Boelter, Engineering: Berkeley and Los Angeles" (University of California: In Memoriam, 1968)

<http://texts.cdlib.org/view?docId=hb238nb0d8;NAAN=13030&doc.view=frames&chunk.id=div00005&toc.depth=1&toc.id=&brand=calisphere> Accessed 10/19/18

<sup>40</sup> Op. cit. U.C. obituary, Joseph Thomas Gier

had an office in 73 Cory Hall and spent the other half of his appointment as the supervisor of the Thermal Radiation Project for the Office of Naval Research (ONR) in the Institute of Engineering Research (IER).<sup>41</sup> He was elected to full membership in the scientific honor society, Sigma Xi, in 1949<sup>42</sup>— a recognition bestowed by invitation only to one who “has shown noteworthy achievement as an original investigator in a field of pure or applied science.”<sup>43</sup> He was also a member of the American Association for the Advancement of Science, and a full member of both the Illuminating Engineering Society (IES) and the American Society of Refrigerating Engineering (ASRE).<sup>44</sup>

Gier won the APA “Man of the Year” award in 1950<sup>45</sup> and was put in charge of the Standards Laboratory in Cory Hall, which was used by “most Departments in the University and by scores of outside companies as a ‘West Coast Bureau of Standards.’”<sup>46</sup> Aircraft industries requested numerous measurements from him for various materials used in jet engines and rocket-type missiles.<sup>47</sup> The dual nature of Gier’s research interests, which straddled ME and EE, may have complicated his career trajectory.<sup>48</sup> Nonetheless, he was promoted to Associate Professor of Electrical Engineering with tenure in 1952.<sup>49</sup>

## Influence

Gier was known for his patience, kindness, and compassion. He had a “friendly and unassuming manner,” was an excellent listener, and took a deep personal interest in students.<sup>50</sup> Edmund Bussey (’49), thought to be one of the first Black students to earn a B.S. in Electrical Engineering from Berkeley,<sup>51</sup> said that he “looked upon him as a role model,”<sup>52</sup> and one colleague described him as “integrity personified.”<sup>53</sup> The APA gave him a second award in 1956 for “Outstanding Service to the Community and Fraternity”<sup>54</sup> and he was honored by the Los Angeles Urban League in 1960 “in appreciation of an outstanding contribution to the Urban League goal of improving living conditions for minority groups through inter-racial cooperation and action.”<sup>55</sup>

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<sup>41</sup> Dunkle, R.V., Gier, J.T. Thermal radiation research, U. S. Office of Naval Research Monthly Research Report, June, 1951.

<sup>42</sup> Op. cit. EECS biographical data, 1957

<sup>43</sup> Sigma Xi: Becoming a Member <https://www.sigmaxi.org/members/becoming-a-member> Accessed 10/19/18

<sup>44</sup> Op. cit. EECS biographical data, 1957

<sup>45</sup> Op. cit. U.C. obituary, Joseph Thomas Gier

<sup>46</sup> D.M. Finch, memo to John Whinnery, 03-Oct-1957

<sup>47</sup> G. J. Maslach, memo to H.A. Schade, 17-Oct-1956

<sup>48</sup> J. R. Whinnery, letter to M. P. O’Brien, 7-Oct-1957

<sup>49</sup> Most references, including Gier's obituary and the JBHE, list the date as 1952 although a few list it as 1953. The confusion may have arisen because, although his tenure was officially granted in 1952, the first semester he worked in his tenured position appears to have been 1953.

<sup>50</sup> Op. cit. U.C. obituary, Joseph Thomas Gier

<sup>51</sup> Op. cit. Humphreys, Sheila

<sup>52</sup> Bussey, Edmund. "Oral History with Edmund "Ed" Bussey by California State University, Sacramento." Interview by Amy E. Holloway, 1998, as part of the History of Sacramento's Economy Project (copyright Center for Sacramento History).

[https://archive.org/stream/BusseyEdmundOralHistTranscript/BusseyEdmundOralHistTranscript\\_djvu.txt](https://archive.org/stream/BusseyEdmundOralHistTranscript/BusseyEdmundOralHistTranscript_djvu.txt) Accessed 12-jun-2019

<sup>53</sup> Thomas McFarland letter to Kathryn Gier, 1961. EECS department personnel file.

<sup>54</sup> Op. cit. U.C. obituary, Joseph Thomas Gier

<sup>55</sup> University Bulletin: A Weekly Bulletin for the Staff of the University of California. Volume 9, No. 19. December 12, 1960.

"News From the Campuses," p. 86 <https://books.google.com/books?id=lvE2AQAAAJ> Accessed 13-mar-19

Gier was promoted to full professor in 1958 and transferred to UCLA at Boelter's invitation shortly afterwards.<sup>56</sup> He had been suffering from high blood pressure and had hoped the move to southern California might improve his health.<sup>57</sup> He finally succumbed to his illness on June 22, 1961<sup>58</sup> at age 50, at the height of his career. The Morrin-Gier-Martinelli Heat Transfer Memorial Laboratory at UCLA was partially named in his honor (Gier's co-honorees, Raymond C. Martinelli and Earl H. Morrin, both studied the thermodynamics of heat transfer and died from leukemia brought on by exposure to Beryllium while doing research on molten metals<sup>59</sup>). The lab is still used today for "investigating single and two-phase convective heat transfer in energy applications, various aspects of radiation transfer in biological systems, and for material synthesis and characterization."<sup>60</sup>

Joseph Gier's legacy lives on. He quietly inspired and influenced the lives of many people who, in turn, influenced the lives of others. By setting a precedent, he made it easier for those who followed him and enriched the academic and scientific landscape for everyone. Lasting change happens slowly and Gier, who believed in the inherent "goodness of man,"<sup>61</sup> led by example.

## How Did Berkeley Lose Track of Joseph Gier?

Two primary factors contributing to Gier's forgotten legacy were probably his untimely death in 1961 at the age of 50, and his transfer from Berkeley to UCLA three years before, during which time he was only able to work intermittently. Most of the students who knew him at Berkeley had left by 1961, and he had not yet had time to fully establish himself at his new campus before his death. Recognition and appreciation of African American contributions only became part of popular American consciousness after the Black Power movement,<sup>62</sup> which had not yet begun when Gier died, and which would not peak for another decade. His youngest students were born one generation too early to bring that awareness with them when they arrived at Berkeley.

Although Gier's career had been included in *The Journal of Blacks in Higher Education*, his achievements at Berkeley were so singular they appear to have predated a culture prepared to recognize them.

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<sup>56</sup> Whinnery, John R. "John R. Whinnery: Researcher and Educator in Electromagnetic, Microwaves, and Optoelectronics 1935-1995; Dean of the College of Engineering UC Berkeley 1959-1963." Interview by Ann Lage in 1994. Oral History Center, The Bancroft Library, University of California, Berkeley, 1996. P. 119

<http://digitalassets.lib.berkeley.edu/rohoia/ucb/text/electromagnetics00whinrich.pdf> Accessed 19-Jan-2019

<sup>57</sup> Op. cit. Thomas McFarland letter to Kathryn Gier, 1961

<sup>58</sup> Ancestry.com. California, Death Index, 1940-1997 [database on-line]. Provo, UT, USA: Ancestry.com Operations Inc, 2000

<sup>59</sup> Maslach, G. J., "George Maslach, Aeronautical engineer, professor, Dean of the College of Engineering, Provost for Professional Schools and Colleges, Vice Chancellor for Research and Academic Affairs, University of California, Berkeley, 1949 to 1983," conducted by Swent, Eleanor in 2000, Regional Oral History Office, The Bancroft Library, University of California, Berkeley, 2000. P.117 <http://digitalassets.lib.berkeley.edu/rohoia/ucb/text/aeronoticaleng00maslrich.pdf> Accessed 11/12/18

<sup>60</sup> UCLA Samueli Mechanical & Aerospace Engineering Research Labs: Morrin-Gier-Martinelli Heat Transfer Memorial Laboratory (Pilon) <https://www.mae.ucla.edu/laboratories/#MGM>

<sup>61</sup> Op. cit. U.C. obituary, Joseph Thomas Gier

<sup>62</sup> "African American Heritage: Black Power," National Archives <https://www.archives.gov/research/african-americans/black-power> accessed 01-dec-2021