

**Lehigh University  
MINUTES OF THE FACULTY MEETING  
(Sinclair Auditorium)  
September 14, 2009**

**Presiding: President Alice Gast**

President Gast called the meeting to order at 4:12 PM.

**1. Minutes:** The May 4, 2009, meeting minutes were approved unanimously by the Faculty, as posted in the folder “Secretary of the Faculty/2008-09” on the Lehigh University Faculty Blackboard.

**2. Consent Calendar:** There were no Consent Calendar motions posted on the “Lehigh University Faculty” Blackboard.

**3. Memorial Resolutions:** (See end materials included with these minutes.) Professor Don Davis presented a Memorial Resolution for Chuan-Chih Hsiung, Professor Emeritus of Mathematics. Professor Robert Thornton presented a Memorial Resolution for Jack Keefe, Professor Emeritus of Economics. Professor Marvin White presented a Memorial Resolution for Larry Varnerin, Professor Emeritus of Electrical and Computer Engineering. The Faculty observed a moment of silence after each resolution. The Faculty approved these resolutions by acclamation and requested that a copy be sent to the family of each departed colleague.

**4. Special Election:** Prof. Erica Hoelscher presented the slate for two positions that needed to be filled.

1. Committee on Discipline - at large position - term expires 2012: No candidates.

2. Faculty Personnel Committee - at large position, tenured associate professor, may be elected to this committee only once - term expires 2014: the slate included Profs. Gunter, Maskulka and Munson. Prof. Gupta was also originally on the slate for the FPC, but withdrew due to the fact that he is a full professor.

Prof. Gunter then volunteered to move to the open position on the Discipline from the FPC slate.

[Secretary’s note: After the meeting the final results were tallied and Prof. Munson received the most votes but declined to serve; the FPC will continue with current members until November when there will be another election. Prof. Gunter is now the new member of the Discipline Committee.]

**5. Introduction of New Full-Time Faculty:** President Gast thanked former Provost El-Aasser for his great recruiting successes. She also introduced the new Provost, Patrick Farrell, noted that his academic research was in fluid mechanics and commented that he is focusing his current efforts on the strategic vision for Lehigh. Provost Farrell then introduced the new full time faculty members who are tenure track, visiting or professors of practice. Information on full time tenure track faculty was also available in a booklet provided by the Provost’s Office in September, 2009.

|              |                |   |   |
|--------------|----------------|---|---|
| <b>Ambar</b> | <b>Saladin</b> | <b>Visiting Faculty</b>   | <b>Political Science and Africana Studies</b> |
| <b>Floyd</b> | <b>Beachum</b> | <b>Peter Bennett '63 Chair in Urban Principalship &amp; Associate</b> | <b>Center for Dveloping Urban</b>             |

|                    |                 | <b>Professor</b>  | <b>Educational Leaders</b>                  |
|--------------------|-----------------|---|---|
| <b>Christopher</b> | <b>Bohan</b>    | <b>Visiting Faculty</b>   | <b>Theatre</b>                              |
| <b>Taïeb</b>       | <b>Berrada</b>  | <b>Assistant Prof</b>   | <b>Modern Languages &amp; Literature</b>    |
| <b>Andrew</b>      | <b>Coleman</b>  | <b>Professor of Practice</b>                                    | <b>Civil and Environmental Engineering</b>  |
| <b>Paul</b>        | <b>Brockman</b> | <b>Professor and Joseph R. Perella and Amy M. Perella Chair</b> | <b>Finance</b>                              |
| <b>Jorge</b>       | <b>Cortiñas</b> | <b>Assistant Prof</b>   | <b>Theatre</b>                              |
| <b>Frank</b>       | <b>Curtis</b>   | <b>Assistant Prof</b>   | <b>Industrial &amp; Systems Engineering</b> |
| <b>Cirleen</b>     | <b>DeBlaere</b> | <b>Assistant Prof</b>   | <b>Counseling Psychology</b>                |
| <b>Beibei</b>      | <b>Dong</b>     | <b>Assistant Prof</b>   | <b>Marketing</b>                            |
| <b>David</b>       | <b>Folsom</b>   | <b>Assistant Prof</b>   | <b>Accounting</b>                           |
| <b>Mary</b>        | <b>Foltz</b>    | <b>Assistant Prof</b>   | <b>English</b>                              |
| <b>William</b>     | <b>Forster</b>  | <b>Assistant Prof</b>   | <b>Management</b>                           |
| <b>Almut</b>       | <b>Hupbach</b>  | <b>Assistant Prof</b>   | <b>Psychology</b>                           |
| <b>Hyun-Tae</b>    | <b>Jung</b>     | <b>Assistant Prof</b>   | <b>Art, Architecture, &amp; Design</b>      |
| <b>Ernest</b>      | <b>Lai</b>      | <b>Assistant Prof</b>   | <b>Economics</b>                            |
| <b>Jeremy</b>      | <b>Littau</b>   | <b>Assistant Prof</b>   | <b>Journalism &amp; Communication</b>       |
| <b>Yvonne</b>      | <b>Lu</b>       | <b>Assistant Prof</b>   | <b>Accounting</b>                           |
| <b>Yung-Yu</b>     | <b>Ma</b>       | <b>Assistant Prof</b>   | <b>Finance</b>                              |
| <b>Joseph</b>      | <b>Manzo</b>    | <b>Professor of Practice</b>                                    | <b>Accounting</b>                           |
| <b>Douglas</b>     | <b>Mahony</b>   | <b>Assistant Prof</b>   | <b>Management</b>                           |
| <b>Jeetain</b>     | <b>Mittal</b>   | <b>Assistant Prof</b>   | <b>Chemical Engineering</b>                 |
| <b>Rob</b>         | <b>Neel</b>     | <b>Assistant Prof</b>   | <b>Mathematics</b>                          |
| <b>Nikolai</b>     | <b>Nikolov</b>  | <b>Assistant Prof</b>   | <b>Art, Architecture, &amp; Design</b>      |
| <b>Holona</b>      | <b>Ochs</b>     | <b>Assistant Prof</b>   | <b>Political Science</b>                    |
| <b>Nada</b>        | <b>Sanders</b>  | <b>Professor &amp; Iacocca Chair</b>                            | <b>Management</b>                           |
| <b>Linei</b>       | <b>Shan</b>     | <b>Professor of Practice</b>                                    | <b>Modern Languages and Literature</b>      |
| <b>Tanya</b>       | <b>Saunders</b> | <b>Assistant Prof</b>   | <b>Sociology &amp; Anthropology</b>         |
| <b>Shigeru</b>     | <b>Suzuki</b>   | <b>Visiting Faculty</b>   | <b>Modern Languages and Literature</b>      |
| <b>Jason</b>       | <b>Travers</b>  | <b>Lecturer</b>   | <b>Art, Architecture and Design</b>         |

|                |                    |                |                                   |
|----------------|--------------------|----------------|-----------------------------------|
| Michael        | Spear              | Assistant Prof | Computer Science & Engineering    |
| Parvathinathan | Venkitasubramaniam | Assistant Prof | Electrical & Computer Engineering |
| Andrew         | Ward               | Associate Prof | Management                        |
| Brenna         | Wood               | Assistant Prof | Education & Human Services        |

**6. Old Business:** None.

**7. New Business:** None

**8. Committee Report:** Prof. Linda Lowe-Krentz provided a very brief update to remind faculty that the Faculty Committee on Student Life is now up and running. The working group will be considering strategies for integrating faculty into student life activities. Another large challenge will be to integrate undergrad and grad student life on campus. The Middle States report had proposed some small grants to develop "Core Competencies" and integrate them with student life activities on campus. This committee will report at the next meeting regarding these grants. Finally, in considering a change last spring to the R&P policy on student dissent, the Faculty referred this issue to the new Student Life Committee to return their recommendations to the Faculty, either to eliminate or re-write it.

**9. Reports and Announcements:**

President's Report

President Gast welcomed the new faculty to Lehigh, commenting that our excellent recruiting last year will be an important addition for Lehigh's future. She then turned to the dual challenges of implementing the Strategic Plan and responding to the recent financial conditions. On facing our financial challenges squarely with hard work, she thanked everyone for their efforts to cut budgets on short notice in order to move funding into the financial aid reserve, now at about \$8 million. In FY 2010, we have been fortunate to have a bit more than half (52.5%) of Lehigh's operating revenue come from tuition and fees. Unfortunately, the dramatic drop in PA state research funding has affected the other portion of operating revenues, with Federal funding basically flat. Endowment as of 6/30/09, was \$882.6 million, having lost about 18.3% over the past year. While Lehigh has had a difficult year financially, it has not been disastrous as for more heavily endowed schools that lost 20 to 30+%. Our risk factor is predominantly in the tuition paying families who support private higher education. The data on sources of financial aid indicate that government loans are funding a decreasing share of Lehigh student tuition and Lehigh is funding a larger share of the financial aid. We need to model this to make projections about the future impacts of this trend. There is a faculty and student group who will assist in modeling the relationship between economic indicators and Lehigh student demand for private higher education. Armed with this information, we plan to be able to make better decisions about how to spend our limited financial aid reserve funds as wisely as possible.

Implementing the Strategic Plan: There has been tremendous progress in the Strategic Thinking process over the past few years and extensive contributions from all parts of the Lehigh community. This culminated in February, 2009, with the Board of Trustees approving the Strategic Plan. With this Plan, we want to build on our current strengths and move into becoming a premier residential research university, internationally recognized for research excellence and a distinctive student experience. The plan calls for addressing grand challenges in strategic areas of focus, including research and graduate studies; promoting student success; and becoming connected with our external as well as campus community. The last item is particularly difficult because there is no one set of parameters to guide

how we want to become better connected as a community. Instead it is a dynamic process where we will need the Council for Equity and Community (CEC) to provide some ideas and to lead discussions on aspirational goals for what the community believes we should become. In this way we can begin to implement and develop processes that will lead to that better community.

As an aside, President Gast invited everyone to attend the Town Hall Meeting on Thursday, Sept. 17 at 1 pm to learn more about the different levels of progress being made on many aspects of the Plan.

Already, as part of the Strategic Plan implementation process, there have been many activities that are altering what we do and how we do it. Even with the tough economic times, there are new programs under development, with leaders and supporters taking part who provide the organizational structure to ensure that we have forward motion. Implementation of the Strategic Plan is a parallel process which is now underway across campus. It will involve a number of groups and individuals and will be coordinated and supported through a working website, similar to the one we used for the Strategic Thinking process. There, many different participants will post working documents, some of which are mainly to generate further thoughts and ideas, others to describe how we can define benchmarks and monitoring metrics specific to Lehigh, for example. We will use the faculty committee structure as much as possible, along with the various councils (e.g., CEC) and staff committees (e.g., ERAC).. President Gast requested that we all read and provide comments and feedback on documents posted on the new Strategic Plan Implementation website.

The President also discussed resource analysis methodology that is being used to drill down at many levels to find where University needs are and how they are met by various types of resources. The objective of this is to provide detailed data for good budget decisions across multiple years. In the past, we have only focused on annual budgets with a single-year horizon. This process emphasizes the interrelatedness of funds across multiple years, so that better short run decisions about tradeoffs necessary to meet longer term goals, such as the decade-long horizon of the Strategic Plan's implementation period. Both internal and external (to Lehigh) benchmarks at different levels of the Resource Analysis diagnostic data will allow evaluation of units' performance to see whether there are lessons that can be learned and adopted to improve the effectiveness of resource use. This may lead to the realization that new data on variables, as yet not studied, need to be generated. We want to keep the pace of implementation as brisk as possible, given the current financial constraints.

The floor was opened for questions and Prof. Bean asked whether the \$8 mill Financial Aid Reserve should be considered as part of the endowment. President Gast responded that while it may be currently invested, the intention is to use it current spending on financial aid needs. He then asked whether Lehigh was funding future students at the expense of current students. The President noted that the funds accumulated for this Reserve were examined closely to ensure that we did not compromise the current student experience. Another colleague asked how the new STEPS building planned to open in the Fall '10 would be affected or would affect other spending plans. Vice President Plympton responded that projected operating funds for the new building had already been included in future budget estimates so that there should be adequate coverage. Prof. Neti asked if the cost of implementing the Plan had been considered or estimated. President Gast explained that she and a group have an interactive projections model that allows varying assumptions to be entered, e.g., the number of faculty, increases in the number of graduate students, etc. and then projects values of key operational variables. In addition to monitoring the progress and further costs associated with the Plan, this model can also be used for scenario analyses for fundraising purposes.

#### Provost's Report

Provost Farrell provided a brief report focused first on a current market-based study of faculty salary being conducted by the deans, FCC and his office. The plan is to share a compilation of the results

when data analyses are completed, possibly as early as the November 2 Faculty Meeting, or at a special session of the Faculty. This benchmark study will help identify gaps, and while resolving the gap issue may take some time, we are looking at budget funding to address this issue.

Provost Farrell's second major topic was undergraduate enrollment data, in which this year's applications were down 13.7 percent compared to last year – 12,961 applications in 2008 vs. 11,185 in 2009. However, based on SAT scores and student Academic Index (combined SAT and class rank), the quality of our incoming first-year class is the same or possibly increased a bit over last year's class. For the fall term, we enrolled 1,194 undergraduate students, with our target being 1,170. Newly enrolled graduate students for the fall term were down slightly—from 734 in 2008 to 683 in 2009.

**10. Adjournment:** The President announced for the nominations committee that today's election results will be reported to the Faculty. It was moved, seconded and approved unanimously by acclamation to adjourn at 5:50 pm.

Secretary's note: I appreciate that Prof. Frank Gunter served as Acting Secretary to record detailed notes of this Faculty Meeting. Any errors or omissions should be attributed to and reported to me.

Respectfully submitted,



**Next Meeting: November 2, 2009, 4:10 p.m., Sinclair Auditorium, 3:30 p. m. reception.**

**UNIVERSITY FACULTY MEETINGS REMAINING 2009-2010**

1. November 2, 2009
2. December 7, 2009
3. February 8, 2010
4. March 22, 2010
5. May 3, 2010

**Memorial Resolution**  
**for**  
**Chuan Chih Hsiung**

The faculty of Lehigh University mourns the death on May 6, 2009, of Chuan Chih Hsiung, Professor of Mathematics, and offers its deepest sympathy to the members of his family.

C. C. Hsiung was born in Shefong, Jiangxi, China, on February 15, 1916. He graduated from National Chekiang University (now called Zhejiang University) in Hangzhou in 1936 and taught and wrote papers in China before coming to the United States in 1945, to enroll at Michigan State University, which was then known as Michigan State College of Agriculture and Applied Science, where In 1948, he received the first PhD in mathematics they ever awarded . He married Wenchin Yu in 1942. They were married for 62 years until her death in 2004. They had one daughter, Nancy, who lives in Weston, Massachusetts.

CC had post-doctoral positions at Wisconsin, Northwestern, and Harvard before coming to Lehigh in 1952. According to his daughter, CC and Wenchin were the second Chinese family residing in the Lehigh Valley. He formally retired in 1984, but maintained an active presence in the math department for nearly 20 more years. He had 20 PhD students altogether, tied with Tommy Wilansky for the most by any math professor at Lehigh. Several of these theses were directed after his retirement, the last one being his niece, Bonnie Xiong, in 1989.

Most of his research was in differential geometry, in which he wrote nearly 100 research papers and two books. Differential geometry applies calculus-type methods to study surfaces of possibly many dimensions, called differentiable manifolds. Differential geometry was the mathematical tool that Einstein needed for

his General Theory of Relativity. Hermann Minkowski was a mathematician who taught Einstein in Zurich and who provided the mathematical formulation for Einstein's Special Theory of Relativity. I mention him because probably CC's most famous theorem is called the Minkowski-Hsiung Integral Formula. CC did not work with Minkowski, but he generalized a formula of Minkowski's to higher dimensions.

There is one theorem of CC's that I can explain here, and I didn't know about it until I was preparing this talk. In China CC studied Tangrams, which are figures which can be formed from these seven standard figures (five triangles, a square, and a parallelogram). When I was a student more than 40 years ago, I was given this book about Tangrams and enjoyed trying to make figures from them. It turns out that CC proved long ago that there are exactly 13 convex tangram configurations. Convex means that lines connecting points of the figure stay totally inside the figure. Here they are in this book, which mentions CC by name. His article about this was published in an American math journal in 1942.

The most important thing that CC did was to found the Journal of Differential Geometry at Lehigh in 1967. This has become one of the most prestigious math journals in the world. For the period 1981-2006, its impact factor was the fifth highest of any math journal. More than anything else, this journal has given Lehigh's math department a high level of international visibility. CC was Editor-in-Chief of this journal for 42 years, until his death. During his last few years, he couldn't do much for the journal, but prior to his health decline, he proofread every article for the journal. He was also an extremely efficient business manager for the journal, and accumulated a lot of money for the use of the math department.

In my opinion, the turning point for the journal, the event that changed it from a narrowly-focused journal to one of international prominence, occurred in 1982, when there were some major breakthroughs in what I would call topology, but they used

some methods of differential geometry. These were the proof of the Poincare Conjecture in dimension 4 and the surprising discovery that 4-dimensional space has many possible differentiable structures, in contrast to the situation in all other dimensions. These fundamental papers were all published in JDG, in part, I believe, through the efforts of CC's co-Editor-in-Chief, S.T. Yau, a very famous professor, now at Harvard.

The money accumulated by the journal has gone into the formation of a C.C. Hsiung Fund for the Advancement of Mathematics. This fund supports a postdoctoral position and also an almost-annual Geometry/Topology conference at Lehigh, since 1986. Every third year, it is held at Harvard. This conference has had many famous invited speakers, but it also offers opportunities for contributed talks, which have been valuable to many. For example, a good friend of mine received a nice job at City University of New York as a direct outcome of his contributed talk at our conference.

Although his direct family was small, CC had a large extended family in the US, and loved getting together with them. At his memorial service in May, many of them shared fond reminiscences about their shared experiences. CC was an avid tennis and ping-pong player. Our department has an annual ping-pong tournament at my house, and CC was usually the winner until about the age of 85.

He will be greatly missed by the math department, but his name will live on through his journal and his Fund for the Advancement of Mathematics.

## Memorial Resolution for Jack Keefe

The faculty of the Department of Economics and the College of Business and Economics note with deep sorrow the passing of Professor John D. Keefe – known to all as “Jack” – on July 16, 2009. Jack was born in 1925 and received his B.S. degree from Lehigh in 1948 and his M.A. degree from Miami University in Florida in 1955. Before coming to Lehigh he worked at the Bethlehem Steel Company. He was also a veteran of World War II, during which he received three Purple Hearts and a Bronze Star. He long remained a loyal and active veteran of his unit.

Jack was hired as an instructor at Lehigh in 1955 and continued to teach here for the next 34 years. He was promoted to the rank of assistant professor in 1971, to associate professor in 1975, and to full professor in 1987. During his time at Lehigh he taught almost every economics course in the College core and then some -- including principles of economics, money and banking, intermediate microeconomic theory, statistical methods, monetary and fiscal policy, labor economics, and corporation finance. He was truly the “utility man” of our economics department. Among students Jack was one of the most popular and sought-after instructors in the department. The old adage “My door is always open” really did characterize Jack’s office on the first floor of Drown Hall, where students always seemed to be present. Jack was also one of the early faculty members of the University Forum, and he served for a number of years as adviser to Omicron Delta Epsilon, the Economics Honorary Society.

Although he suffered from a number of serious physical ailments that greatly limited his mobility, Jack never complained. Instead he maintained an always-cheerful disposition that greatly endeared him to students and colleagues. And because he was restricted to sitting while teaching at a time before overhead projectors and PowerPoint became widespread, he would make frequent use of what he called “air graphs” that he would draw with his fingers.

Jack had a truly wonderful sense of humor that affected his interactions with students and faculty alike. To give just one example, Jack disliked having to deal with students who wanted to argue about their final grades, although he was always patient with them. So back in 1973 he asked one of his teaching assistants (Chip Shoemaker) to develop a series of charts to explain how final grades were determined. One version consisted of a strip of graphs, tables, and figures all taped together which stretched for approximately ten feet and which was completely incomprehensible. Every once in a while when a student would become overly persistent in pleading for a higher final grade, Jack would refer the student to the meandering jumble of graphs, tables, and figures taped to the wall. He would

then explain to the student how the chart showed that his or her final grade was in fact *higher* than the grade that was really deserved. Rumor has it that, not only did this always satisfy the complaining students, but also that Jack used the very same ten-foot long chart every year from 1973 through 1979.

Jack was also generous to Lehigh. His monetary gift to the Economics Department some forty years ago resulted in the creation of what soon became known as the “Keefe Account.” Many economics faculty over the years have drawn upon this account to attend professional meetings and to help finance their research.

The faculty of Lehigh University will sincerely miss Jack Keefe – his stories about life and people, his wonderful sense of humor, and his deep love for Lehigh. We offer our sincere condolences to his wife Kay, to his sons and daughter, and to the rest of his family.

Respectfully submitted,

Robert J. Thornton

Charles Shoemaker

Jon T. Innes

J. Richard Aronson

Eli Schwartz

President Gast, I move that this memorial resolution be made a permanent part of the faculty record by being included in the minutes of this meeting, and that copies be sent to the members of his family.

Memorial Resolution for Lawrence J. Varnerin, Jr.  
Professor Emeritus of Electrical and Computer Engineering

Lawrence (Larry) J. Varnerin, Jr, Professor Emeritus of Electrical and Computer Engineering, died on May 14, 2009 after a long and greatly enjoyed retirement, which he shared with his wife Marie. Larry served Lehigh through mentoring of undergraduate and graduate students, participation in post-graduation celebrations, and as the Chair of the Electrical Engineering and Computer Science Department from 1985 – 1991. In this period, Larry recruited excellent faculty who helped expand the department’s focus on undergraduate teaching to include graduate research. He supported the build-up of Lehigh’s research in compound semiconductors – a foundation for the Center for Optical Technologies of today.

Larry Varnerin was born in Boston, Mass on July 10, 1923. Larry began his graduate studies in physics at M.I.T. in 1940 and continued his studies until he was called into the U.S. Army in his junior year for service in WWII. Early on, he was stationed state-side in Maryland and later transferred to the European theatre, where he served until the end of the war retiring as a Captain in the Army. He returned to M.I.T. to complete his S.B. in 1947, but opted to choose his graduating class as 1944. He received his Ph.D.<sup>1</sup> in Physics (1949) under Sanborn (Sandy) Brown at M.I.T. These studies led to the use of microwaves to determine the average electron energies and the first Townsend coefficient in hydrogen.<sup>2</sup>

After receiving his Ph.D. from M.I.T., Larry worked at Sylvania in Boston from 1949-1952, where his research focused on the electron interactions in hydrogen with the use of microwave propagation in plasmas.<sup>3</sup> Larry and Marie were married in 1952 and afterwards Larry joined the Westinghouse Research Laboratories, in Pittsburgh, from 1952 to 1955, where his research was directed towards the study of electron interactions with metal surfaces<sup>4</sup> and vacuum-enclosed ion gauges.<sup>5 6</sup> He joined AT&T Bell Laboratories in Murray Hill, N.J. in 1955, where he established a distinguished career in applied magnetism. He had responsibility for the development of microwave magnetic devices, such as circulators and isolators, as well as garnet (YIG) single crystal devices, such as microwave power limiters. Larry’s limiter designs<sup>7 8</sup> were employed in the first Telstar communication satellites, which were launched in 1961. As many Bell researchers did at the time, Larry worked on bipolar transistor development with studies of the transit time of carriers across the base region of a transistor.<sup>9</sup>

Early experiments on magnetic bubbles by Bobeck<sup>10</sup> in the late 60’s by Bell researchers encouraged Larry to focus his department’s research on the possibility of heteroepitaxial magnetic layers on non-magnetic garnet substrates. Up to that time, heteroepitaxy within any material system resulted in highly faulted materials with high dislocation densities and gross growth defects; however, Larry and his team were able to achieve essentially defect-free wafers with liquid epitaxy of lattice-matched systems

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<sup>1</sup> Lawrence J. Varnerin, Jr., “Microwave Gas Discharges Under the Action of DC Fields”, M. I.T. Ph.D. (1949)

<sup>2</sup> Lawrence J. Varnerin and Sanborn C. Brown, “Microwave Determinations of the Average Electron Energies and the First Townsend Coefficient in Hydrogen”, *Physical Review*, **79**, 946 (1950)

<sup>3</sup> Lawrence J. Varnerin, Jr., “Electron Recombination and Collision Cross-Section Measurements in Hydrogen”, *Physical Review*, **84**, 563 (1951)

<sup>4</sup> L. J. Varnerin, Jr., “Neutralization of Ions and Ionization of Atoms near Metal Surfaces”, *Physical Review*, **91**, 859 (1953)

<sup>5</sup> L. J. Varnerin, Jr., and D. White, “Ultimate Vacuum in a Vacuum-Enclosed Ionization Gauge”, *J. Appl. Phys.*, **25**, 1207 (1954)

<sup>6</sup> L. J. Varnerin, Jr. and J. H. Carmichael, “Ionic Pumping Mechanism of Helium in an Ionization Gauge”, *J. Appl. Phys.*, **26**, 782 (1955).

<sup>7</sup> R. L. Comstock and L. J. Varnerin, “Operation of a Microwave Garnet Limiter”, *PGMTT National Symposium Digest*, **62**, 142 (1962)

<sup>8</sup> L. J. Varnerin, et al, “The Satellite Ferrimagnetic Power Limiter”, *Bell System Technical Journal*, **42**, 1817 (1963)

<sup>9</sup> L. J. Varnerin, “Stored Charge Method of Transistor Base Transit Analysis”, *Proceedings of the IRE*, **47**, 523 (1959)

<sup>10</sup> A. H Bobeck, et al, “Uniaxial Magnetic Garnets for Domain Wall ‘Bubble’ Devices, *Appl. Phys. Lett.*, **17**, 131 (1970)

through intricate compositional control of the nonmagnetic garnet substrate to an equally intricate magnetic epitaxial layer possessing the right magnetic characteristics.<sup>11</sup> This technology, however, did not find its way into mainstream acceptance, due to advancements in the semiconductor industry. As a result, Larry in the 70's, redirected his group's efforts into the development of III-V compound semiconductor materials for microwave devices. The challenge, of the time was to take a promising, but unreliable technology, to meet the needs of a high-reliability telecommunication system. Larry and his team of researchers were able to achieve high quality gallium arsenide<sup>12 13</sup> and the first large scale use of high-reliability gallium arsenide field effect transistors<sup>14</sup> in the U.S. terrestrial radio relay network and the Telstar 3 system of satellites in the early 80's. In the late 80's, Larry's group at Bell Laboratories established itself at the forefront of high-speed electronics for fiber-optic communications.<sup>15</sup>

Dr. Varnerin was a member of Who's Who in America, the Telephone Pioneers of America and the Magnetic Society, as well as a Fellow (1974) and Life Fellow (1991) of the IEEE 'for contributions to electronic and magnetic devices and materials', a fellow in the American Physical Society and an editor for 20 years of the Journal of Magnetism and Materials, which was founded in 1975. He was also a member of the Lions Club, active in Marriage Encounter, and a signer of the Frederick Seitz Global Warming Petition. Professionally, he presented himself very well and was often mistaken by visitors to Bell Laboratories as an executive at least a couple levels above the department head.<sup>16</sup> Larry and Marie lived in Watchung, N.J. for 30 years, while Larry worked at the Bell Laboratories. Larry retired from Bell Laboratories in 1985 and joined Lehigh University as Chair of the Electrical Engineering and Computer Science Department in the same year.

Larry passed away on Thursday, May 14, 2009 at St. Luke's Hospice in Bethlehem, Pa., surrounded by his loving family. He is survived by his wife of 57 years, Marie Hynes Varnerin; his sons, Lawrence Varnerin, III, and his wife, Jessie of Mechanicsville, Va., Gregory Varnerin and his wife, Debbie Downs, of Watchung, Bruce Varnerin and wife, Debbie, of Ridgefield, Conn., and Jeffrey Varnerin and his wife, Debra, of Berkeley Heights; his daughters, Melanie Viscelli of Branchburg, Sharon Cenci and her husband, Gerald, of Emmaus, Pa., Suzanne Dahlinger of Green Brook, and Carol Levandowski and her husband, Thomas, of Clinton; and his 21 grandchildren. Also surviving are his brother, Robert Varnerin, and his sister, Jean Donahue, both of Milton, Mass.

I request a copy of this resolution be sent to his wife, Marie, and children, Melanie, Sharon, Suzanne, Carol, Lawrence, Gregory, Bruce and Jeffrey, and to his brother Robert and sister Jean.

Submitted to the Lehigh faculty for endorsement on Monday, September 14<sup>th</sup>, 2009, by Marvin H. White, Sherman Fairchild Professor of Electrical Engineering.

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<sup>11</sup> L. Varnerin, "Approaches for making bubble-domain materials", *IEEE Trans. on Magnetics*, **7**, 404 (1971)

<sup>12</sup> H. L. Stormer, A. Chang, D.C. Tsui, J. C. M. Hwang, A. C Gossard and W. Wiegmann, "Fractional Quantization of the Quantum Hall Effect", *Phys. Rev. Lett.*, **50**, 1953 (1983)

<sup>13</sup> Stuart H. Wemple, et al, "Long-Term and Instantaneous Burnout in GaAs Power FETS: Mechanisms and Solutions", *IEEE Trans. on Electron Dev.*, **28**, 834 (1981)

<sup>14</sup> H. Fukui, et al, "Reliability of power GaAs field-effect transistors", *IEEE Trans. on Elect. Dev.*, **29**, 395 (1982)

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