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October 18, 2018

G. Thomas Sallee
Professor Emeritus, Department of Mathematics
President, UC Davis Emeriti Association Executive Committee

M.R.C. Greenwood
Distinguished Professor Emerita, Department of Nutrition
Chair, UC Davis Emeriti Association Awards and Recognition Committee

Dear Tom and MRC,

I am pleased to nominate Distinguished Professor Emeritus **James Shackelford** from the Department of Materials Science and Engineering for the **2019 Distinguished Emeritus/a Award**. I believe Jim deserves this recognition based on both his exemplary scholarship and exceptional teaching service since retiring in 2013.

Since retiring, Jim has produced one invited review paper and *five* books. The review paper (Publication 146 in the attached CV) was presented at the conference SumGlass 2013 in Pont du Gard, France. His invitation to review his extensive research on gas transport in glass was extended by the Nuclear Energy Division of CEA-Marcoule as his research is being used by that agency to better understand the critical role of He gas evolution in the large amounts of nuclear waste stored in France.

The first book published after his retirement was the 8th Edition of his textbook, *Introduction to Materials Science for Engineers* (Publication 147), which is one of the leading books in the field of materials science and engineering. This edition was followed shortly by the corresponding *Global Edition* (Publication 150). In the same time frame, he worked closely with Professor Kazuyuki Kakegawa of Chiba University and Kakegawa's former student and visiting scholar hosted by Jim at UCD, Dr. Kazuo Sunahara, on the Japanese translation of the 7th Edition of the textbook (Publication 148). This was the seventh language into which Jim's textbook has been translated (along with Chinese, German, Italian, Korean, Portuguese, and Spanish). Next, Korean colleagues worked with Jim to produce a 4th Edition of his *CRC Materials Science and Engineering Handbook* (Publication 149). Finally, Jim has recently coauthored with his wife Penelope a truly "Davis" publication, *The Glass of Wine* (Publication 151). Their substantial interaction with the Department of Viticulture and Enology and the Robert Mondavi Institute helped to produce the first in depth account of the intersection of the glass and wine industries.

In addition to this substantial publication productivity, Jim has continued to be heavily involved in teaching. In the year before his retirement, he recorded a complete set of video lectures for Engineering

45 (the introductory materials course for which his textbook was written). Immediately following retirement in the Summer of 2013, he taught the inaugural offering of E45Y in Summer Sessions, the first such "hybrid version" of the course in which all lectures are online, and the instructor of record sets the homework and exams and oversees the laboratory activities. Since 2013, this has become the standard mode of offering E45 in Summer Sessions, with the instructor of record being another faculty member. These video lectures were also the basis of three fully online introductory materials courses offered by Jim through UCD Extension from 2014 through 2016. Of even wider impact, the video lectures were integrated into a Massively Open Online Course (MOOC) developed by UCD Extension entitled "MATERIALS SCIENCE: Ten Things Every Engineer Should Know." The MOOC was one of the first two developed by UCD Extension and debuted on the Coursera platform in December 2015. To date, over 27,000 students from around the world have taken this highly rated course.

Especially helpful to me is that Jim was willing on short notice to agree to a recall appointment in Winter 2018 to teach E45 when a departmental colleague had serious health issues. Unfortunately, this scenario was repeated again in Spring 2018 and Jim was again willing to help the department. In each class, the enrollments were approximately 100 students. This extensive teaching service was in addition to regular guest lectures since retirement in both E45 and EMS 182 (an upper division course on the failure analysis of materials).

I must also note that Jim has been invited to lecture in Asia frequently before and after his retirement. Since retirement, he has taught E45 in a condensed time frame in Vietnam (in Fall 2013) at the Hanoi University of Mining and Geology as part of an ongoing service of our former Department of Chemical Engineering and Materials Science. Jim's role was highlighted in the January issue of the American Society for Engineering Education's *Prism* magazine. Jim also provided a Skype lecture in July 2015 to the materials science group at the Pusan National University of South Korea on the topic of "Advanced Materials – Emerging Trends." A major teaching commitment in China began in the 2016 Spring Semester at the Wuhan University of Technology (WHUT). Former Dean Enrique Lavernia had been instrumental in helping to develop the International School of Materials Science and Engineering at WHUT and asked Jim to provide lectures in their introductory materials course. In fact, Jim is currently there on his fourth 2-week visit. Each time, he lectures for two weeks on a different segment of the "Fundamentals of Materials Science" course. By the next visit in Fall 2019, he will have covered the complete course content.

Jim's outstanding commitment to materials education has been recognized over the years with numerous honors. Since retirement, he has received an Outstanding Service Award from UC Davis Extension (2014), the inaugural Award for Outstanding Contributions to Materials Education at the North American Materials Education Symposium (2016), and, in 2019, will receive the Albert Easton White Distinguished Teacher Award from ASM International, the largest materials science professional society. The latter is a seminal achievement for a materials educator and highlights the impact that Jim has had on the field of materials science and engineering throughout the world.

Of course, the committee would know that Jim served as co-chair of the Emeriti Association's Program Committee for four years following his retirement. He tells me that this additional service was most enjoyable, but that his commitment to the publishing and teaching obligations outlined above did not allow continuing that work. But, his involvement in the Emeriti Association is a tangible example of his deep commitment to UC Davis.

In summary, Jim Shackelford has continued to be a highly active and visible teacher and scholar since his retirement. His work in our field is widely recognized for its excellence and he has received several prestigious awards in retirement as a result. Equally important is that Jim has remained dedicated to UC Davis and to extending its impact throughout the world through his materials science books, his teaching and his fascinating book on *The Glass of Wine*. He is an outstanding representative of the finest qualities of a UC Davis emeritus/a and is highly deserving of recognition as the recipient of the UC Davis **2019 Distinguished Emeritus/a Award.**

Thank you,

Jeffery C. Gibeling, Professor and Chair
Materials Science and Engineering

James F. Shackelford

Department of Materials Science and Engineering
University of California, Davis
Davis, California 95616

Education

- Ph.D. in Materials Science and Engineering, University of California, Berkeley, 1971
- M.S. in Ceramic Engineering, University of Washington, 1967
- B.S. in Ceramic Engineering, University of Washington, 1966
- A.A. in Engineering, Yakima Valley College, Washington, 1964

Academic experience

- University of California, Davis, Distinguished Professor Emeritus, 2013-present
- University of California, Davis, Acting Assistant Professor to Distinguished Professor, Associate Dean for Undergraduate Studies, Director of Integrated Studies Honors Program, Director of University Honors Program, 1973-2013, full-time
- McMaster University, Hamilton, Ontario, Canada, Postdoctoral Fellow, 1972-1973
- University of California, Berkeley, Postdoctoral Fellow, 1971

Current Membership in Professional Organizations

- American Ceramic Society
- ASM International

Honors and Awards

- Albert Easton White Distinguished Teacher Award, ASM International, 2019
- Award for Outstanding Contributions to Materials Education at the North American Materials Education Symposium (NAMES), 2016 (Inaugural Awardee)
- Outstanding Service Award, UC Davis Extension, 2014
- Outstanding Teaching Award, College of Engineering UC Davis, 2012
- Fellow, ASM International, 2011
- Distinguished Teaching Award, Academic Senate, University of California, Davis, 2003
- Nona Sall Education Award, Capitol Center MESA, 2002
- Outstanding Educator Award, American Ceramic Society, 1996
- Fellow, American Ceramic Society, 1992
- Outstanding Contribution Award, Minority Engineering Program, University of California, Davis, 1992
- Founders Award, Capitol Center MESA, 1991
- Northern California Section Award, American Ceramic Society, 1989
- Outstanding Teaching Award, University of California, Davis Student Branch ASME, 1976-1977

Service Activities

- Authored eight editions of introductory textbook, *Introduction to Materials Science for Engineers*
- Edited four editions of the *CRC Materials Science and Engineering Handbook*.
- Served 17 years as Principal Investigator for various Mathematics, Engineering, and Science Achievement (MESA) programs.
- Served 10 years as Regional Director for NSF funded California Alliance for Minority Participation (CAMP), a Louis Stokes Alliance for Minority Participation (LSAMP).
- Served 10 years as Associate Director for Education of the NSF funded Center for Biophotonics Science and Technology (CBST).

Key publications

- J. F. Shackelford, *Introduction to Materials Science for Engineers*, Eighth Edition, Pearson, Upper Saddle River, NJ (2015) 662 pp.
- J. F. Shackelford, "Gas Solubility and Diffusion in Oxide Glasses – Implications for Nuclear Wasteforms," *Procedia Materials Sci.,* **7** 278-285 (2014)
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- M.T. Powers, J. F. Shackelford, B. Chan, N. Dudley, J. Luhn, C. Lung, and K. McNalley "Pb-Free Solder Assembly of a Printed Circuit Based Multi-Chip Module: A University-Industry Design Project," in *Proc. 4th Intl. Brazing and Soldering Conference, Orlando, FL, Apr. 26-29, 2009,* A. Rabinkin, R. Gourley and C. Walker, eds., ASM International and American Welding Society, Metals Park, OH (2009) pp. 29-36
- T.B. Tran, J.R. Groza, and J. F. Shackelford, "Nanoscale Hydroxyapatite for Biomedical Applications," *Ceramic Engr. & Sci. Proc.,* **29** [7] 249-258 (2008)

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1970 2. SOLUBILITY OF GASES IN GLASS - A MONATOMIC MODEL,
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J. F. Shackelford, J. S. Masaryk, and R. M. Fulrath, *Journal of the American Ceramic Society* 53(7): 417.

1972 4. SOLUBILITY OF GASES IN GLASS. II. He, Ne, and H_2 IN FUSED SILICA,
J. F. Shackelford, P. L. Studt, and R. M. Fulrath, *Journal of Applied Physics* 43(4): 1619-1626.

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1976 8. NONDESTRUCTIVE TESTING OF CERAMICS - A NOMOGRAPH FOR X-AND-γ RADIOGRAPHY,
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9. THE THERMODYNAMICS OF WATER AND HYDROGEN SOLUBILITY IN FUSED SILICA,
J. F. Shackelford and J. S. Masaryk, *Journal of Noncrystalline Solids* 21(1): 55-64.

10. NDT OF CERAMICS - QUANTITATIVE X-RADIOGRAPHY USING A DEBYE-SCHERRER CAMERA,
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19. EVALUATION OF A COMMERCIAL, POROUS STAINLESS STEEL AS A PROSTHETIC IMPLANT MATERIAL,
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1989 49. INTRODUCTION TO MATERIALS SCIENCE FOR ENGINEERS, SECOND EDITION,
J. F. Shackelford, Second edition, reprinted by World Publishing Corporation, Beijing, China (see A-44).

A. PAPERS AND BOOKS PUBLISHED

J. F. Shackelford

1990 50. INTRODUCTION TO MATERIALS SCIENCE FOR ENGINEERS, SECOND (INTERNATIONAL) EDITION,
J. F. Shackelford, reprinted by Maxwell Macmillan Publishing Company, Singapore, 732 pages (see A-44 and A-49).

51. A CRITICAL REVIEW OF RESIDUAL STRESS TECHNOLOGY,
J. F. Shackelford and B. D. Brown, *International Advances in Nondestructive Testing* 15: 195-215.

52. GAS TRANSPORT IN VITREOUS SILICA FIBERS,
R. S. Wortman and J. F. Shackelford, *J. Noncrystalline Solids* 125: 280-286.

53. SOLUBILITY AND DIFFUSIVITY OF ARGON IN VITREOUS SILICA,
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54. MEASUREMENT OF RESIDUAL STRESS IN ENGINEERING CERAMICS BY X-RAY DIFFRACTION - A CASE STUDY OF A SPANISH BASALT GLASS-CERAMIC,
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J. P. McIntyre, J. F. Shackelford, M. W. Chapman, and R. R. Pool, *Amer. Ceram. Soc. Bull.* 70(9): 1499-1503.

57. ADVANCED ENGINEERING CERAMICS FOR BIOMEDICAL APPLICATIONS,
J. F. Shackelford, *Proceedings of the International Symposium on Advanced Ceramics 90, Key Engineering Materials,* Vols. 56-57, Trans Tech Publications, Switzerland: 13-22.

1992 58. INTRODUCTION TO MATERIALS SCIENCE FOR ENGINEERS, THIRD EDITION,
J. F. Shackelford, Macmillan Publishing Company, New York, 793 pp.

59. INSTRUCTORS MANUAL FOR INTRODUCTION TO MATERIALS SCIENCE FOR ENGINEERS, THIRD EDITION,
J. F. Shackelford, Macmillan Publishing Company, New York, 487 pp.

60. THE CRC MATERIALS SCIENCE AND ENGINEERING HANDBOOK,
J. F. Shackelford and W. Alexander, CRC Press, Boca Raton, FL, 841 pp.

A. PAPERS AND BOOKS PUBLISHED

J. F. Shackelford

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J. F. Shackelford, *Encyclopedia of Applied Physics*, Vol. 3, VCH Publishers, Inc.: 169-187.

62. TRANSPARENCY MASTERS FOR INTRODUCTION TO MATERIALS SCIENCE FOR ENGINEERS, THIRD EDITION,
J. F. Shackelford, Macmillan Publishing Company, New York, 256 pp.

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