

James C. Wyant – Lighting the Future

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ABSTRACT

James C. Wyant has made profound contributions to the field of optics not only through technical innovation but as a leader in education, research, and economic impact. By championing and investing in the development and enrichment of the future talent pool, and successfully encouraging others to join in this mission, Dr. Wyant has bolstered the foundations of our field with indelible advances in our capacity to realize the remarkable potential of optics to better humankind. This brief piece will capture some of my personal recollections in working with Jim in these endeavors.

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1. JIM THE STATESMAN AND ENTREPRENEUR

I first became aware of Jim Wyant through his professional society leadership roles. In particular, this included his highly visible tenure as President of SPIE in 1986 and President of OSA in 2010. Because this latter role coincided with my own service on the Board of Directors of OSA, I could witness first-hand how effective Jim was in getting diverse interests to work together towards common goals. In these capacities, and countless other committee roles where Jim generously contributed his time, his soft-spoken style with razor-sharp reasoning has always been well-received by his many colleagues in the professional community and has helped to advance the professional society international agendas, especially in outreach and education.



Figure 1. Jim Wyant has had tremendous positive impact through his effective leadership in professional societies, including serving as President of SPIE in 1986 and President of OSA in 2010 (photo at right courtesy of OSA).

In actuality, I had been influenced by Jim Wyant independently in my professional career at Bell Laboratories in the 1980's when we were pioneering the field of photonic integrated circuits (PICs). The new and more complex processing sequences in indium phosphide-based compound semiconductors used to simultaneously create tunable lasers, integrated waveguides, modulators, switches and detectors was ripe with opportunity for things to go astray, and high potential to have a non-functioning PIC without knowing why. While an experienced eye could often identify insufficient etch depths by very careful focusing techniques in a high-resolution microscope, or see unintended remaining material or roughness from chemically-selective processes, this was not an easy task and was very hard to communicate to new trainees.

At the time, a remarkable non-contact interferometric metrology tool emerged on the market with the high lateral resolution required to map these morphologically complex PIC structures. Our group was an early purchaser of the WYKO TOPO 3D instrument shown in Figure 2 below. Although at the time I did not associate this with Jim Wyant, I was later duly impressed by Jim's entrepreneurial skills to be able to commercially offer such an innovative and useful capability.

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Figure 2. (Left) The WYKO TOPO 3D interferometric metrology tool. (Right) The headquarters of the WYKO Corporation in Tucson, AZ. WYKO was a highly successful company founded by Jim and his students, serving a substantial market especially as a critical inspection tool in the hard disk drive industry.

2. JIM THE EDUCATIONAL LEADER

My deeper and more personal introduction to Jim Wyant came upon my signing on as the new dean of the College of Optical Sciences at the University of Arizona, taking over in that role in 2012. Jim had joined what was the Optical Sciences Center (OSC) in 1974 as Assistant Professor, then stepped quickly through the ranks as Associate professor in 1976 and Full Professor in 1979. During his extraordinary academic career, Jim has been the principle supervisor of 34 PhD students and 25 MS students. While Jim had continued teaching while founding and building WYKO, he returned in full capacity as Director of OSC in 1999 and subsequently led OSC to transition from a center to a college at the University of Arizona, and became the founding dean of the College of Optical Sciences from 2005 until 2012. We still fondly refer to the college often as OSC, despite its status as a full college.

My experiences working with Jim have been both highly remarkable and highly rewarding. Upon taking over as dean, it was quickly clear that I was “on my own”, and Jim obviously made some effort to avoid any interfering influences by initially not attending faculty meetings or voicing opinions, etc. He even made sure to have me inherit his telephone number so I would get all the incoming calls seeking engagement with the dean or the college! However, Jim had assembled remarkable staff and support which made this transition very manageable and effective from my perspective. Especially influential and relevant to this narrative was the growing role of our new Director of Development, Kaye Rowan, who was hired just before my joining.



Figure 3. James C. Wyant, Founding Dean of the College of Optical Sciences at the University of Arizona.

3. LIGHTING THE FUTURE: SUPPORTING STUDENT SUCCESS

Very shortly after my arrival Jim made it clear that he wanted to identify ways to help advance the mission of the college, including personal financial support but also in rallying the support of others. A very important and distinguishing aspect of this offer of help was that Jim had just spent the prior 12 years leading OSC, and thus brought deep insights into the challenges and opportunities facing the college both in the context of the university and in the external landscape at large.

I have a strong recollection of the long walk and lunch we had together where we discussed these challenges, quickly arriving at the mutually shared view that the first-year graduate PhD student experience posed a bit of a dilemma. Many of our most successful PhD students joined the college with undergraduate degrees in closely related fields such as Physics,

4. LIGHTING THE FUTURE: FUELING THE GROWTH

After this tremendous boost to OSC and the future of the optics and photonics community, Jim continued to discuss with me and Kaye Rowan how to further help OSC increase its impact in advancing the field of optics and photonics. Growth of the college was central to these discussions, and the key elements of growth included a new building, new faculty and new students. It is noteworthy that the affordability of more graduate students tends to scale with increased faculty and faculty extramural research, whereas the affordability of new faculty positions and a new building requires new up-front investments. While there was significant consideration given to the idea of rallying investment in a new building, Jim led us in our realization that having a sustainable pathway to afford new faculty would provide perhaps the most compelling rationale for also attracting investment for a new building. Combined with the renewed sense that leading by example would again draw in additional investment, Jim worked with Kaye to launch the James C. Wyant Endowed Chair Fund in 2018, with Jim making a commitment of \$20,000,000 and offering a three-to-one match for contributors to named, new endowed chair faculty positions in the College of Optical Sciences. These Endowed Chairs in Optical Sciences would be \$2,000,000 each with Jim's contribution alone ensuring a minimum of ten new endowed chair faculty positions. However, if a donor or group of donors offer a \$500,000 commitment, they will benefit from a matching \$1,500,000 from Jim's fund in the background and can name the endowed chair. Including Jim's support of one chair in its entirety in honor of Emeritus Professor and former OSC Director Robert Shannon, this allows for twelve additional named chairs for a total of thirteen new endowed chair faculty positions.

This commitment was extremely well-received from both the university and external community, with the university indeed agreeing to support the now-funded college growth with the construction a major new building in the general vicinity of the existing Meinel building for OSC and other research growth on campus.



Figure 5. Dr. James C. Wyant discussing the impact he hopes to achieve in collaboration with the community at the event celebrating the creation of the James C. Wyant Endowed Chair Fund.

In the short time since this announcement, six endowed chairs in this program have already been named publicly: the J.W. and H.M. Goodman Endowed Chair in Optical Sciences, the Robert R. Shannon Endowed Chair in Optical Sciences, the SPIE Endowed Chair in Optical Sciences, the John Paul Schaefer Endowed Chair in Optical Sciences, the Jack Jewell Endowed Chair in Optical Sciences, and the Nasser Peyghambarian Endowed Chair in Optical Sciences. Several more have been established but not yet announced, and in addition Dr. Wyant contributed to double the first endowed chair

generously established in the college by Professor Harry Barrett and his wife Cathy, the Harrison H. and Catherine C. Barrett Endowed Chair in Optical Sciences for Cancer Imaging, bringing the total to fourteen \$2,000,000 endowed chairs.

In recognition for Jim's leadership and impact at the college, the university, and the community at large, the President of the University of Arizona approved the renaming of the College of Optical Sciences to be the James C. Wyant College of Optical Sciences in March of 2019 as illustrated with the new entry lettering on the building shown in Figure 6.

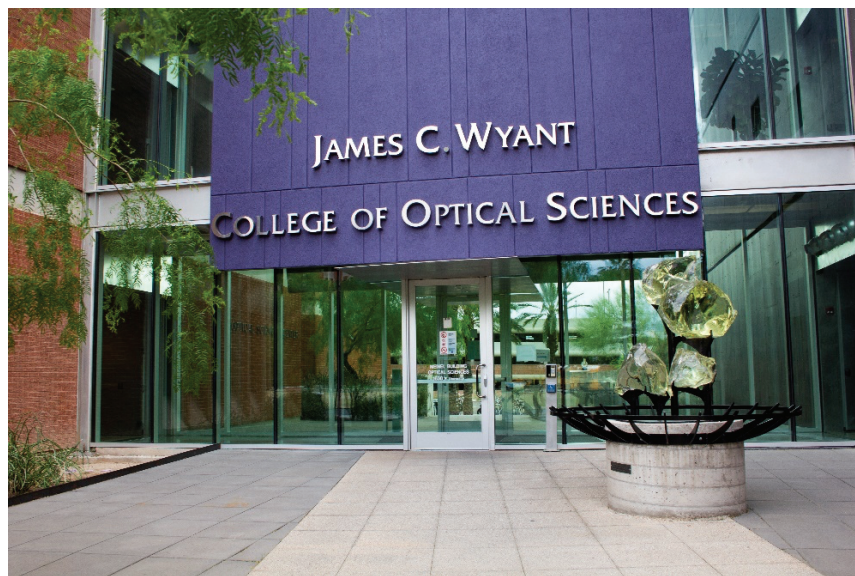


Figure 6. The entry into the newly-renamed James C. Wyant College of Optical Sciences.

To further memorialize Jim's role in establishing OSC as a college, and for his tremendous leadership in advancing its mission, the college commissioned bronze plaques by renowned Arizona sculptor Deborah Copenhaver Fellows and life story boards provided by Tammy Orr for both Aden B. Meinel, the founder of OSC and namesake of our building complex, and James C. Wyant, OSC director and founding dean of the college. These plaques, shown below, are now proudly displayed in our lobby and are a much-appreciated focus of interest for visitors to the college.



Figure 7. Plaques in the lobby of the Wyant College of Optical Sciences. (Left) Aden B. Meinel, Founding Director of OSC (Right) James C. Wyant, Founding Dean of the College of Optical Sciences.

5. LIGHTING THE FUTURE: 2021 AND BEYOND

The Wyant College of Optical Sciences is now poised for an exciting growth period, anticipating a scaling of as much as 40% in all dimensions of faculty, staff, facilities and students. Several of the Endowed Chairs in Optical Sciences are already filled with searches underway to fill more. Our Associate Deans for Graduate and Undergraduate Academic Affairs are committed to growth in both our graduate and undergraduate student bodies, finding innovative ways to highlight the remarkable career opportunities and exciting impact of our field to new student populations.

The University of Arizona is following through with the exciting facilities growth plan with a new Grand Challenges Research Building that will be not only be proximate to the Meinel facility, but will actually be adjacent to it and connected to the current West Wing with a bridge with meeting tables as shown below in Figure 8.



Figure 8. (Left) Site location of new Grand Challenges Research Building (GCRB) showing location in what was previously the parking lot behind the Meinel West Wing. (Right) Side artist view of entry courtyard and connecting bridge to Meinel.



Figure 9. Construction is underway for the new Grand Challenges Research Building in the former parking lot behind the Meinel West Wing, with occupancy is scheduled beginning in January 2024.

The GCRB will comprise a seven-story, 108,000 gross square foot building with one floor below grade and six floors above. In addition to use of the meeting and teaching spaces on the ground floor, the Wyant College has three dedicated floors of optics and photonics laboratories and office space. Additional optics space includes yet another floor dedicated

to the new NSF Engineering Research Center, the Center for Quantum Networks awarded in 2020. This exciting ten-year undertaking will lay the foundations for the future quantum internet where quantum-enabled sensors, quantum computing, and quantum communications can be connected and entangled at distance with fault-tolerant quantum coherent links and repeaters. The Wyant College of Optical Sciences is leading this ERC with core partners Harvard, MIT and Yale.

The prospects are very bright indeed for the students and faculty of the Wyant College of Optical Sciences. With Jim Wyant's leadership in Lighting the Future, the college finds itself very well-positioned to provide the talent and make research contributions that will fuel a great century ahead that will deepen our understanding of the fundamental science of light-matter interactions and make exciting advances in the amazing proliferation of optics and photonics applications that will permeate and benefit our lives tremendously.

Thank you, Jim!