Lecture abstract

The U.S. has entered a new phase of how energy generation portfolios are determined, driven by an abundance of low-cost natural gas and explosive growth and dramatically falling prices for electricity generation from renewable energy sources such as utility scale photovoltaics (PV) and wind. Regions of the U.S. with high solar fluence and wind resources (with a combined population of ca. 70M people) are projected to produce up to 50% of their electricity from PV and wind by 2030, in parallel with the retirement of older fossil fuel generating stations. These dramatic changes, however, come at a time of unprecedented “water stress” to these same communities, which is driving the need to look at new ways of acquiring, conserving, purifying and reusing “fit for purpose” water. Low cost thin film solar cells have entered the picture as a potential pathway to electricity generation that provides for their integration into buildings (BIPV) and even greenhouses, where food can be grown in eﬃcient, low-water and energy use, controlled environments with semi-transparent solar cells as both a window and an energy source. In this talk we’ll review what life (and “energy/water stress”) is like in an arid U.S. environment, show some of the emerging semi-transparent thin film solar cell technologies (being integrated into greenhouses) that our interface science program has been supporting, and finally more tightly focus on some of the nanometer scale interface science issues that have to be addressed to ensure that these technologies really matter to our energy future.

Neal Armstrong is a Regents Professor of Chemistry/Biochemistry/Optical Sciences at the University of Arizona, where he has been a faculty member since 1978. His program has focused almost exclusively on the interface science, at nanometer length scales, of emerging technologies such as organic light emitting diodes (OLEDs), thin film solar cells (OPVs and perovskites), and thin film chemical sensing teodes (-d
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Dr. Dawson served in several academic positions in Illinois, Wisconsin, Nebraska and Louisiana and also worked on the Manhattan Project as a Research Chemist and Group Leader in the Metallurgical Laboratory at the University of Chicago. In 1946, he was [Ĕ[þ}§} ĊÃ§ T[þ)§é[þĊÑ§ÖĊă '§þĊµs[Ċ§Ú´ <§þĊ [Ö} [NîJî Patent for his efforts on the Manhattan Project, which led to the discovery of a fundamental process for the extraction [Ö} éēþµs[ĊÚÖ Ú´ ĊÃ§ §í§Ñ§ÖĊă éíēĊÚÖēÑ [Ö} Ö§éĊēÖēÑî He was a member of the committee that organized the Oak I}»§ 3ÖăĊĊēĊ§ Ú´ =ēsí§[þ JĊē}§ă [Ö} Ĕ[ă [sÚēÖsí ÑŞÑ i§þ of the Institute.

Professor Dawson came to the University of Kentucky in 1945 as Head of the Department of Chemistry. He provided key leadership in initiating and building the doctoral program in sÃ§ÑăĊþĜ [Ċ ĊÃ§ ēÖę§þăĊĜî 0Úþ §ĕ[Ñéí§z Ö Ãă µþăĊ }§s[}§ Ö the department, he individually obtained the major portion Ú´ §ĕĊþ[Ñēþ[í þ§ă§[þsÃ ăēééÚþĊî)ēþÖ» ÃăĊĔ§ÖĊĜÂµę§ Ĝ§[þă with the department, he held contracts for fundamental sÃ§Ñs[í þ§ă§[þsÃ ĔĊÃ ĊÃ§ NîJî I þÑĜz ĊÃ§ =[ĊÚÖ[í Js§Ös§ 0ÚēÖ}[ĊÚÖ [Ö} ĊÃ§ IĊÚÑs *Ö§þ»Ĝ 'ÚÑÑăăÚÖî

He directed or co-directed seventeen Ph.D. dissertations [Ö} ÖÖ§ <îJî ĊÃ§ă§ăî 2§ Ĕ[ă [Ċ[í§ÖĊ§} þ§ă§[þsÃ }þ§sĊÚþ and had a special ability to imbue his students with a concise, sí§[þ [Ö} sÚÑéí§Ċ§ ăs§ÖĊµs ĔþĊÖ» ăĊĜí§î 2§ éē i íăÃ§} ÑÚþ§ ĊÃ[Ö µ´ĊĜ þ§ă§[þsÃ é[é§þă }§[íÖ» ĔĊÃ ĊÃ§ sÃ§ÑăĊþĜ [redacted]ns and coauthored a reference book [redacted]

[redacted]er teacher both in the classroom and in [redacted]s and discussions. His leadership and [redacted]aduate teaching assistants and junior [redacted]ecome more effective teachers. His [redacted]tion to high achievement standards [redacted]n, education and training set the tone [redacted] years to come.

IÖÚĊÃ§þ ă»Öĺs[ÖĊ sÚÖĊþ iēĊÚÖ ĊÚ ĊÃ§ }§é[þĊÑ§ÖĊ Ĕ[ă Professor Dawson's indefatigable advocacy for a new chemistry building. His leadership in soliciting and designing a replacement for the former chemistry building, Kastle Hall, culminated in the opening of the current Chemistry-Physics Building in 1963.

He also served the campus community in other ways. Dr. Dawson was elected a Distinguished Professor in the College Ú´ IþĊă [Ö} Js§Ös§ă Ö á×¶¹®á×¶¶z [Ö} Ĕ[ă [éé ÚÖĊ§} ĊÚ ĊÃ§ þ[ÖÌ Ú´)ăĊÖ»ēăÃ§} GþÚ´§ăăÚþ Ö ĊÃ§ µ§í} Ú´ GÃĜăs[í Chemistry by the University of Kentucky Board of Trustees Ö á×¶Ćî 2§ ă§þę§} [ă IsĊÖ» + 2§ ĊĆî ! Ż é ط ʿ á×¶¹®á×¶ á¶ [D

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