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Inside the lab: Roark Chao and the making of light

At 10, Roark Chao started teaching himself Java so he could make his own Minecraft mods. Eventually, his ideas got ahead of his hardware. So he started building computers, too.

When it came time to choose a college in 2020, one detail sold him on UC Santa Barbara: a teaching cleanroom where he could make his own silicon chips as an undergraduate. His verdict: “This is the place.”

At 19, Chao reached out to engineering professor Jon Schuller about joining his nanophotonics group. Before long, Schuller had given him a project to lead. Chao worked out the theory, ran simulations, fabricated devices and tested how they performed.

Today, Chao is a doctoral student in electrical engineering and a fellow at UCSB’s Institute for Energy Efficiency. He works with Schuller and Steven DenBaars, who co-directs UCSB’s Solid State Lighting & Energy Electronics Center with Nobel laureate Shuji Nakamura. All three have collaborated with Chao on a problem that long challenged LED researchers: how to make red microLEDs that produce light as efficiently as their blue counterparts using the same family of materials.

For Chao, there’s a personal reason to care about how much energy it takes to produce light. His late father grew up without electricity on a farm in rural China.

One of Chao’s ambitions is to make lighting affordable in rural communities where the cost of bringing in power can put it out of reach.

Ask him what else he’s found in the lab and he comes back to the people: “Some of my closest friends these days are people I met through research.”

Tags
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