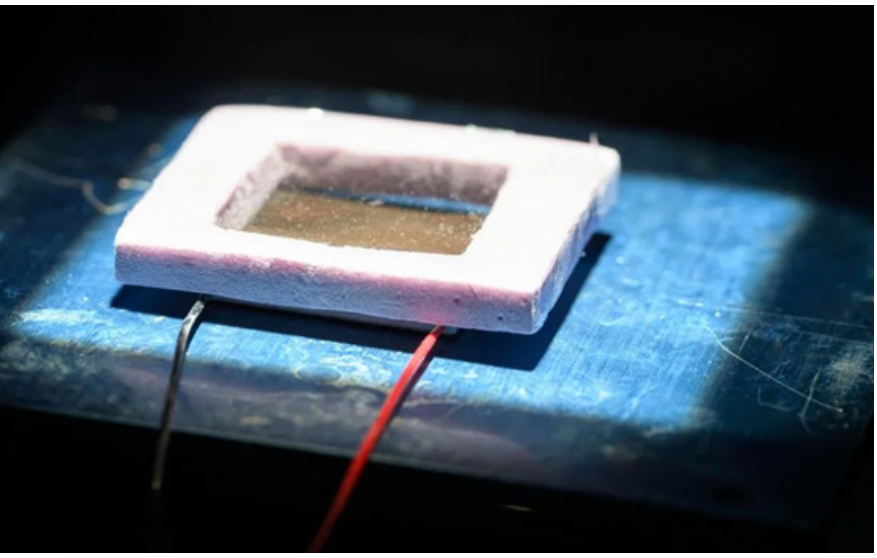
In The News

# New device generates 15x more electricity

Researchers exploring solar thermoelectric generators (STEGs) as an alternative to traditional solar panels have long faced a major hurdle: low efficiency. Unlike photovoltaic cells, STEGs generate electricity using the Seebeck effect by creating a temperature difference between a hot and cold side. However, most STEGs convert less than 1% of sunlight into electricity, compared to about 20% for standard solar panels. A team at the University of Rochester dramatically improved STEG efficiency—boosting power output by 15 times—without altering the semiconductor materials. Instead, they enhanced energy absorption and heat management. On the hot side, they used femtosecond lasers to create nanoscale structures on tungsten, turning it into a "black metal" that absorbs more solar energy. They then added a plastic cover to trap heat, mimicking a greenhouse. On the cold side, they treated aluminum to improve heat dissipation through radiation and convection. Their upgraded STEG successfully powered LEDs and could support wireless sensors, wearable tech, or off-grid systems in rural areas. The study was published in *Light: Science and Applications*. ◆

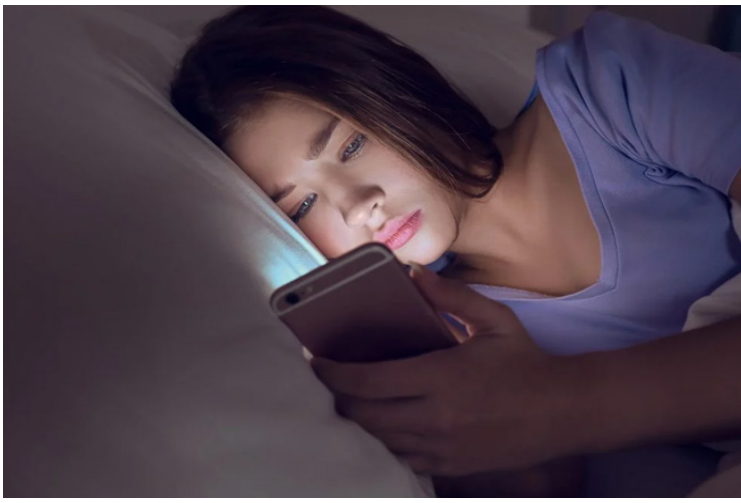


# New moth species discovered

A vividly colored moth long mistaken for a known species has now been identified as entirely new. Entomologist Dr. Peter Huemer of the Tyrolean State Museum in Innsbruck, Austria, described the species in *Alpine Entomology,* naming it *Carcina ingridmariae* in honor of his wife on their 42nd wedding anniversary. Despite its striking pink and yellow hues, the moth was overlooked for over a century due to its close resemblance to the widespread oak carcina (*Carcina quercana*), first recorded in 1775. The breakthrough came with DNA barcoding, which revealed over 6% genetic divergence between the two species. Follow-up anatomical studies of reproductive structures confirmed the finding. The moth, about 2 cm in wingspan, is found across the eastern Mediterranean, including Greece, Croatia, Turkey, and Cyprus. Its caterpillars likely feed on oak trees, similar to its sister species, but more research is ongoing. Dr. Huemer, who has described over 200 European species in his 35-year career, called it "the prettiest species" he's ever encountered, making the name dedication an "obvious" choice. ◆

# Long screen time is bad for kids' hearts

Spending long hours on phones, computers, or gaming devices may increase the risk of developing cardiometabolic problems, such as high blood pressure, insulin resistance, and elevated cholesterol, according to a new study published in the Journal of the American Heart Association. Researchers analyzed data from over 1,000 Danish children and teens and found that more recreational screen time was linked to increased cardiometabolic risk. Each additional hour of screen time raised risk scores by 0.08 standard deviations in 10-year-olds and 0.13 in 18-year-olds. Lead author Dr. David Horner of the University of Copenhagen said even small increases add up over time, especially in youth spending three or more hours on screens daily. The study also found that shorter sleep duration and later bedtimes worsened the effects of screen time. Using machine learning, researchers identified a unique metabolic "fingerprint" in the blood associated with screen use, suggesting early biological changes. Experts recommend sleep-focused screen limits and parental modeling of healthy habits. While observational, the study highlights screen time as an important factor in early heart health. ◆



# Hidden Cost of Smart AI

German researchers have found that AI models designed for step-by-step reasoning can emit up to 50 times more $CO_2$ than models that provide short, direct answers. Published in *Frontiers in Communication,* the study tested 14 large language models (LLMs) across 1,000 standardized questions. Models that "think" before responding generated an average of 543.5 internal tokens per question, compared to 37.7 from concise models—leading to much higher emissions without always improving accuracy. The most accurate model, Cogito (70 billion parameters), achieved 84.9% accuracy but emitted three times more $CO_2$ than similar-sized concise models. The study found an "accuracy-sustainability trade-off," with no low-emission models exceeding 80% accuracy. Subjects like abstract algebra and philosophy produced up to six times more emissions than simpler topics. Lead author Maximilian Dauner emphasized that users can lower emissions by choosing efficient models and prompting for concise answers. For example, DeepSeek R1 answering 600,000 questions emits the same $CO_2$ as a round-trip flight from London to New York. Raising awareness of AI's environmental cost could help promote more responsible use. ◆