OPTICAL COMMUNICATIONS

Organics bring the bandwidth*Nat. Commun.* **11**, 1171 (2020)

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Organic semiconductors offer potentially lower-cost processing compared to their inorganic counterparts, which has led to their use in a broad range of electronics applications. Notably, the materials have seen wide-scale commercial success in flat panel displays in the form of organic light emitting diodes (OLEDs), where high-speed operation is not critical. However, their low charge-carrier mobility has limited broader use in high-speed electronics. Ifor Samuel and colleagues have now overcome some of physical limits of organic semiconductors and developed high-speed OLEDs for potential use in high-bandwidth optical communications.

The researchers — who are based at the University of St Andrews and the University of Edinburgh — optimized several device parameters, including the device geometry and the choice of materials. They were able to minimize parasitic losses within the devices, in turn demonstrating OLEDs that operate at bandwidths reaching 245 MHz. Furthermore, they use their OLED devices in a two-metre visible light communication data link using an orthogonal frequency division multiplexing modulation scheme. The data link can achieve a maximum data rate of 1.13 Gigabits per second.

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