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Light but strong

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Global warming is looming over the future of our planet more every day. While renewable energy is an important part of the solution, it is only by improving the efficiency of vehicles that any progress can be made. As heavier vehicles burn more fuel and less efficiently, using materials that are lighter but strong is one way to achieve the desired efficiency without compromising safety or utility. One example of such materials, that are already being widely used in the automotive and aerospace industry, is fibre-reinforced polymer composites. The current polymer composites enhance the efficiency of vehicles by up to 20%. To further improve this, one needs to fundamentally understand the structure and behaviour of polymer composites. My research utilizes computer simulations to discover the different properties of polymer composites to provide engineers with the information critical to building high-performance and more sustainable materials.