



TakeAIM 2019 Runner-Up:

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Your phone vibrates... [1 new notification]

With a swipe across the display, at once your phone unlocks and the latest TakeAIM submission illuminates the screen.

This process may seem insignificant but behind the glass of the phone's display, trillions of liquid crystal molecules have sprung to life and are held in place by electric fields allowing information to reach the display. Liquid crystal displays, like the one you're reading this on now, are everywhere. What are these mysterious liquid crystal molecules though? Well, they're exactly that, a liquid just like water or oil, but they also exhibit molecular order typical of crystalline materials. This molecular order allows the liquid crystal to interact with light and electric fields, which is perfect for use in a display.

Behind every liquid crystal display, there's a story of engineering, chemistry and mathematical theory that originated right here in the UK. With the combined efforts of engineers at the Royal Radar Establishment and chemists of Hull University, the UK lead the charge in developing the first liquid crystal displays.

Here's where I come in, working closely with a world-leading liquid crystal manufacturer (Merck KGaA), we study the flow of liquid crystals. By using mathematical models we give new understanding of the display manufacturing process where controlling flows of liquid crystal is essential for creating reliable and robust modern devices. With this insight, existing methods of display manufacturing can be improved, paving the way for the displays of the future.

The Smith Institute, enabled by the generous sponsorship of our leading corporate partners, ran the TakeAIM competition in 2019 to make visible the crucial role that mathematics will increasingly play in all aspects of our lives. The competition was open to undergraduate and postgraduate students working in the mathematical sciences. First prize was £1,000 of Apple or Amazon vouchers, with second prize winners receiving £200 and 8 runners-up receiving £25 in their choice vouchers.