Recent advances in Mathematical Virology

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I will give an overview of recent applications of mathematical and computational techniques to problems in mathematical virology. First, I will review recent group and tiling theoretical methods for describing the surface structure of virus capsids - the protective containers harbouring the virus genome - and their relation to fullerenes and self-assembling proteins. Second, graph theoretical methods play a fundamental role in the assembly of such polyhedral protein containers. These geometric insights have led to novel approaches towards anti-viral therapy and the assembly of artificial virus-like particles, so I thirdly also discuss recent work on the computational modelling of virus infection, both at the immunological and intracellular level. At the end, I will briefly hint at my algebraic interests outside of Mathematical Virology for potential further discussion elsewhere.