

1125-16-1934      **Siân Fryer\*** ([sianfryer@math.ucsb.edu](mailto:sianfryer@math.ucsb.edu)). *From prime ideals to physics, via total nonnegativity.*

We start with a very classical question in representation theory: obtain a description of the prime and primitive ideals in a given algebra. For certain types of nice noncommutative algebra (e.g. the families known as quantum algebras and CGL algebras) this can be achieved by first studying finitely many “ $H$ -primes”. If we restrict our attention further to just the algebras coming from the standard quantization of the coordinate rings of matrices, there are remarkable connections between the  $H$ -primes in these algebras and cells of totally nonnegative real matrices (matrices in which every minor is nonnegative).

Recently the combinatorial behaviour of totally nonnegative cells has also been linked to several questions in physics, in particular the computation of scattering amplitudes in the quantum field theory  $N = 4$  SYM. I’ll talk about ways we can use techniques developed to study  $H$ -primes in order to tackle some of these questions about scattering amplitudes. (No prior physics knowledge required!) (Received September 19, 2016)