

## L a u d a t i o

In recognition of his many insightful contributions to the physics  
of topological and disordered quantum matter

### **Prof. Dr. Siddharth Parameswaran**

has been awarded the

#### **Martin Gutzwiller Fellowship 2024/25**

of the Max Planck Institute for the Physics of Complex Systems.

Sid Parameswaran's invaluable contributions to condensed matter and many-body quantum physics range from quantum Hall physics via the interplay of symmetry and topology all the way to the mysteries of many-body localisation. The hallmark of his work is a combination of conceptual originality, technical capability, and genuine attention to experiment. As a result, he has left his mark on a wide range of developments. Which of these to highlight is largely an issue of personal choice, and the following selection aims to provide a flavour of the excitement generated by his work.

In the field of topological electrons, Sid Parameswaran identified the role of non-symmorphic symmetries for precluding the existence of band insulating states. This provided a novel route to avoiding conventional behaviour, and further ramifications are discovered to this day, for example concerning the existence of topological magnetic phases in non-symmorphic insulators.

In quantum Hall physics, Sid Parameswaran's early intervention in the field of what has become known as fractional Chern insulators provided a clear theoretical picture to the nature of such states, and their relation to conventional continuum fractional quantum Hall states. Similarly, and much more recently, for correlated electron physics in moiré systems, his work has proven to be a level-headed guide to the complex phase diagram of twisted bilayer graphene.

Sid Parameswaran's influence is visible in many other items, be it nematic valley order in quantum Hall systems, the discovery of bionic spin liquids, the study of dimers on quasicrystals, or noting the relevance of Kosterlitz-Thouless physics to many-body localisation.

Throughout his career, Sid Parameswaran has held himself to high standards, e.g. somewhat unfashionably, preferring a correct interpretation of experiment over a flashy one. This goes along with the observation, from the perspective of a reader of his manuscripts, that Sid Parameswaran's style is to combine depth with crispness, so that it is easy to engage with his results both on the conceptual and technical level.

We are happy to have Sid Parameswaran spend an extended period of time at the Max Planck Institute for the Physics of Complex Systems, and very much look forward to discussions with him on these and many further topics.