

Dublin, December 3, 2025
[S. Hutzler]

PACKING PROBLEMS – Opening words

Let me start by thanking people,
James, for the introduction,
the School of Physics for their generous support, and for always allowing slightly unusual things to happen here – for our 300 years of Physics celebrations last year I was able to stage an obscure performance on acoustics – it's this environment that makes me enjoy working here so much.

A big thanks to Colin Martin from the RHA for being so enthusiastic when I approached him with my idea for an exhibition, and for seeing the project through.

And last but not least: the biggest thanks is of course to all the artists that contributed by engaging with **PACKING PROBLEMS**.

What are **PACKING PROBLEMS**? As with all problems, you recognize them when you have them, that is when the taxi waits outside your door while you're trying to stuff items randomly into your suitcase. Folding up those shirts saves space – also because then there is no need to bring an iron!

Packing problems relate to questions concerning dense arrangements of objects.

Let's have a look at that familiar arrangement of apples on a table and compare this with the grains of rice in a box.

The apples are stacked in a regular manner, in a pattern associated with Johannes Kepler [SHOW BOOK COVER]. The grains are oriented randomly.

Apples are, roughly, spherical in shape. Rice grains are, roughly, cylindrical. [ROLL UP THE MANUSCRIPT] Does this affect how apples or grains can be arranged?

The grains on the table are confined in all directions by the box and the box is large compared with the grains. The apples experience only one surface. Is this relevant for the way they stack?

And what if the apples were squishy and would “give in” when in contact (like ripe plums)? (Nobody would buy them ...)

And could one fit more grains into the package if they were all aligned? Or if they were more spherical? Or if had the shape of M&M sweets?

And what if there were two types of apples, red and green? No. What about small and large?

And since I am a physicist: Does the arrangement of apples tell us something about the arrangements of atoms in a material, for example in kitchen salt?

And look at yourself, squeezing into this room (wishful thinking!)? How are you arranged? And are people in a crowded bus packed like grains of rice that have been soaked for a while to get squishier? Have the people been drenched in the rain while waiting for the bus? [SORRY, I MIGHT HAVE LOST IT THERE]

In any case, the questions that I just posed, and many other related ones, refer to what scientists call **PACKING PROBLEMS**.

They are discussed in great detail, and, I'm afraid, on a very scientific level, in the new book "Packing Problems in Soft Matter Physics", of which myself and Denis Weaire are co-editors. (Two of the other four editors have strong TCD connections: Ho-Kei Chan, now Professor at the Harbin Institute of Technology, China, was my post-doc. Adil Mughal, Lecturer in Aberystwyth University, is a long-time collaborator of Denis and myself.)

Anyway – **PACKING PROBLEMS** – since I knew that nobody would turn up on a Wednesday evening to hear me advertising the book (which would have been meaningless, as it is not on sale here in the room), I thought what else could I do to make folks think about packing – what a mission! My idea was to tell artists about packing problems, and see whether I could interest them in the subject and get them to offer their own views. Because then you would have something to look at, and would not need to listen to me for too long!

At this stage I hand over to Colin Martin, Head of School and Studios at the Royal Hibernian Academy to introduce and open our exhibition.