

Departmental Colloquium

Realising Mathematical Abstractions

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Abstract: We often think about how mathematical ideas can be used to model the world or physical processes within it. It is one of the great motivations for the study of mathematics. What happens when we reverse that? Asking instead how the world can be used to model mathematical ideas, and what we can learn from observing them. An interesting outcome is that this can lead to new ways to interact between mathematics and the world, some surprising like the development of manufacturing techniques. An example is a CNC router this has three axes (labelled naturally X, Y and Z) and it thus provides a model of 3 dimensional linear algebra with a basis. Once that relationship has been established a link between movements of the machine and paths in the linear algebra can be developed. This has received plenty of attention from the manufacturing side, for example in the calculus necessary to correctly accelerate the different axes to create a smooth path. Going into the detail of these ideas will show the creation of the zipform system for curved metal beams that has been used for art sculptures and engineering.

Friday, April 14 at 3:00 PM in 636 SEO