**Sam Hartharn-Evans**

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**Bio**

Initially studying a degree in Marine Biology and Oceanography, I have an interest in understanding physical processes in the ocean, and how they interact with different systems, in particular sea ice in the rapidly changing Arctic Ocean. Previously I investigated the role of freshwater in the Arctic Ocean, but now in my PhD focus on the specific processes around internal waves.

In my spare time, I enjoy cycling, and am a keen trombone player, playing in a local brass band and acting as charity trustee of the UniBrass Foundation to support university level brass banding.

**Research Questions**

My PhD Project, titled “internal solitary waves in ice-covered waters” investigates how oceanic internal solitary waves (which are waves travel along density interfaces within the water column, and act in a “solitary” manner) interacts with sea ice. This research is primarily laboratory based, using a 7m long flume tank in our laboratory, along with numerical simulations. Three research questions are being addressed during this project so far:

* How stratification affects the behaviour of shoaling Internal Solitary Waves?
* How stratification impacts boluses produced by fissioning Internal Solitary Waves?
* How do internal solitary waves interact with sea ice in the Arctic Ocean?

Watch a recent presentation to find out more about our research: <https://youtu.be/tFY4UQiwxl0>

**Techniques**

As studying internal waves in situ, particularly in the Arctic Ocean, is practically challenging, I study internal waves in the laboratory using a purpose built flume at Newcastle University, which we visualise using seeding particles illuminated by a vertical thin light sheet (e.g. <https://youtu.be/2FGGAnJFoJo>). This method allows us to gain high spatial and temporal resolution to our observations, and really pick apart any dynamics we observe.

In addition to the laboratory, we have recently been using the SPINS numerical model (Subrich et al., 2013) to extend our experimental output further, and to gain a full suite of simultaneous measurements not available in the laboratory.

**Supervisors**

* Magda Carr, School of Mathematics, Statistics and Physics, Newcastle University, UK
* Andrew Willmott, School of Mathematics, Statistics and Physics, Newcastle University, UK
* Adrian Jenkins, Department of Geography and Environmental Sciences, Northumbria University, UK