



# Cologne Geosciences Colloquium

Fortnightly on Mondays at 5 pm

Geo-/Bio-Hörsaal

for members and staff of the Department of Geosciences,  
doctoral students, Masters' students and other interested people



**Monday 24<sup>th</sup> November 2014**

**Dr Stephan de Roode**

**Geoscience and Remote Sensing, Delft University of Technology, the Netherlands**

*“What controls the  
stratocumulus cloud  
amount?”*

## **Abstract:**

Stratocumulus clouds form over relatively cold parts of the ocean during conditions with large-scale subsiding air motions. Stratocumulus cloud layers are rather thin, with typical cloud layer depths of the order of several hundreds of meters, yet they have a great significance to weather and climate due to their high reflection of solar radiation. Because stratocumulus clouds cover large parts of the global oceans, it is therefore interesting to ask how the global stratocumulus cloud amount may change under a global warming scenario. On the one hand one could argue that the stratocumulus cloud amount will diminish as the saturation water vapor concentration will increase in warmer air (i.e. warmer air can "hold" more water vapor), but on the other hand a warmer sea surface temperature will cause a higher evaporation rate, which could favor more or thicker stratocumulus clouds. To shed some light on this question idealized experiments have been performed with high-resolution large-eddy simulation models. Each experiment has been repeated for warmer atmospheric conditions and a higher sea surface temperature (+2K). In addition, the cases have been run with single-column model versions of climate models. The results are interpreted by means of a simple conceptual model. It is found that the entrainment rate of warm and dry air from just above the cloud top plays a key role in controlling the change in the stratocumulus cloud amount.

## **Upcoming event in winter semester 2014/2015:**

**08 Dec:** Dr **Arko Lucieer**, University of Tasmania, Australia: *Rise of the Drones: how Unmanned Aircraft Systems (UAS) create new opportunities for environmental remote sensing and geosciences*

For questions or suggestions contact Dr Karin Boessenkool (kboessen@uni-koeln.de; phone: 470 5925)

For the latest schedule check: [www.geosciences.uni-koeln.de](http://www.geosciences.uni-koeln.de) and follow the link to "Cologne Geosciences Colloquium"