

# HOW TO SEE NORTHERN LIGHTS THROUGH THE CLOUDS IN ENGLAND

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## ABSTRACT

I briefly describe my personal memories on the solar flare of April 10 2001. I was running CDS observations that week and was closely following the evolution of the Sun. When the flare occurred (as I predicted) and the halo CME followed, the following day I alerted all my friends to go out and look for auroras. I then took my bike..

## 1. A SHORT STORY

During April 2001 I was working in an office in the historical Silver Street location of the Department of Applied Mathematics and Theoretical Physics (DAMTP), University of Cambridge, UK [the Department later moved near the Cavendish laboratory]. I was a 'young' post-doc, full of enthusiasm for solar physics, working with Helen Mason in the Atomic Astrophysics group. I had recently obtained a PhD at the University of Central Lancashire, under the supervision of Barbara Bromage. I was very lucky to start my PhD just one month before SOHO launch, so I enjoyed and shared the enthusiasm of the entire solar physics community during the first few years of the mission. In many respects, the SOHO experience has been a roller-coaster that has changed both my professional and private life, in many aspects for the better.

DAMTP was in an excellent location, very close to the Anchor and Eagle pubs, Kings College, etc.. However, my office window was opposite an un-exciting darkish brick wall (Figure 1). So my real window to the outside world and universe was the monitor screen, with its daily images of the Sun from SOHO.

At the time we were running campaigns for observations of active regions, mostly focussed on the Coronal Diagnostic Spectrometer on SOHO. We were particularly interested in small solar flares and chromospheric evaporation [we have actually obtained some new scientific results, some of which have been published, but this is another story].

In the beginning of April the Sun started to be very active, and I was getting very excited. On April the 3rd, a huge X17 flare was unleashed. On the 9th AR 9415



*Figure 1. The view from the DAMTP office window in Silver Street, Cambridge*

was growing fast and approaching the meridian. It produced an M8-class flare. During that week Dominic Zarro and Chris Maroney were attending the CDS operations at GSFC, so the previous day I urged them to run our studies on this active region, for as long as possible. I could sense that this active region was going to produce a big flare. The following day I followed the real-time images, and found out that it did flare, but in the early part of the day, when CDS was running the synoptic observations [obviously..]. My studies were scheduled for later during the day, and only observed the post-flare structures.

I was a bit disappointed. However, I soon found out that a fast-moving halo Coronal Mass Ejection (CME) followed. It was so fast that it caught its predecessor on the way to Earth. Later I followed the CME when the high-speed wind was recorded by SOHO and WIND. I soon realised this was my first chance to see the northern lights, and sent the following e-mail to everyone I knew:

Sent: April 11, 2001 14:12  
Subject: Northern lights !

Hi my friends,  
an Active region on the Sun yesterday produced a big flare, and also hurled a coronal mass ejection toward Earth.

We could see some Northern Lights tonight!  
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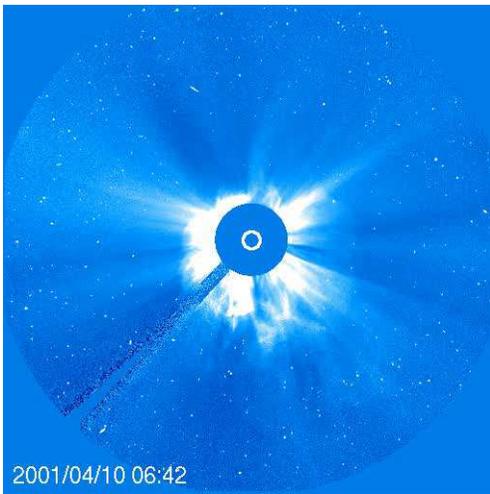


Figure 2. SOHO/LASCO C3 image of the halo CME.



Figure 3. Cambridge and its colleges during two sunny days.

do not ask me how and where to see,  
because I have never seen them. May the  
sky be cloudy-free for once in the UK!  
All I know is that if you leave in the  
north you might have a chance. Say  
northern than London. But who knows.

....

A good Easter to you all,

cheers,

--

Giulio

As everyone else in Cambridge, I was using my old bike  
[a present from Andy in Preston] as the main mean of  
transportation. With my great surprise, I found out that in

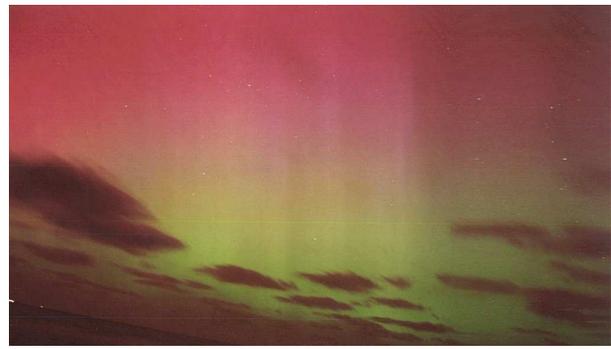


Figure 4. The aurora seen from Bergen aan Zee, The Netherlands at 2300 local time on April 11, 2001

Cambridge you can get many beautiful sunny days such as those shown in Figure 3. However the weather is very variable, and, of course, it was completely cloudy the whole afternoon and evening of the 11th. Despite that, I decided to take my chances and at dark I biked north of Cambridge, to get as much away as possible from the city lights. I ended up in a dark field near a busy highway, not the most romantic of the places! Well, with great surprise, after some time, the clouds broke up a bit, to let me see a stunning ballet of lights. I have never seen anything like that. I did not have a camera, however Figure 4 shows the aurora as recorded by Jan Volkers the same night from The Netherlands. What I saw was similar to what recorded in this picture (aside from the colours). For Jan it was also the first time. He wrote the day after: *Yesterday evening I saw my first-ever aurora. It was stunning!*.

Later on I biked back home, happy for my Easter present, thanks to SOHO. If it was not for SOHO I would not have known when to look out for an aurora and I would still not have seen one. If it was not for SOHO I would not have had the excitement of predicting a flare, seeing its evolution, its CME, its solar wind near Earth and finally the ultimate show of the northern lights.

## ACKNOWLEDGMENTS

I very much appreciated working in the Atomic Astrophysics group of DAMTP, and I warmly thank the Department for allowing me to continue to work there as a visitor from time to time.

I thank Jan Volkers for providing the image of the aurora.