

Barrow IHY 2 transcript  
FROM THE SUN TO THE STARS

(Music)

Titles  
HELIOPHYSICS BELOW ZERO

(Definition types on – typewriter keys click)

JOHN RICHARDSON

Heliophysics is the study of essentially everything to do with the Sun, ranging from the Sun's surface, all the way out through the solar system to where the solar wind interacts with the interstellar medium.

JOHN COOPER

We're here in Barrow and, you know, it is... we're starting here the first day of sunrise, after a couple of months of the cold and the dark here...

TROY CLINE (as part of a webcast)

"This is a conference that brings together representatives and scientists from all over the world, to come in a talk about various topics like the Earth's changing polar environment, the Earth's magnetosphere, the Earth's atmosphere, and then they also talk about the Sun's energy and how it affects the Earth and other planets in the solar system.

(Music)

JOHN COOPER to the conference

If you see an aurora, I want you to run around, waking everyone up so we can see the thing. The only reason that you guys came here is to see the aurora!

(Laughter)

LEWIS BROWER (safety briefing)

If you're going to go hunting for them, I'd just go down to the beach road, and go up North as far as you can, and turn all the lights off.

(Music)

(Driving on snowy road)

TROY CLINE

We're going to a fishing village, away from the lights, to see if we can see the aurora, which is coming and going – we've seen it a few times tonight.

LOU MAYO?:

Yeah, is anyone looking for bears?

PASSENGER

Yeah, been sorta keeping an eye out...

Why are we stopped?

JAY FRIEDLANDER

They just stopped shoveling the road. So we are now at the end of the road in Barrow.

(Laughter)

Which way should I go?

Passengers:

Back! Backwards!

This is what it takes to get your license in Alaska.

(Yelps)

This is serious stuff, here.

There's a polar bear back there, really confused.

(Laughter)

What the hell are these humans doing?

(Music and blowing wind)

JONATHAN NICHOLS

We're looking for auroras... trying to take photos of auroras. Which means I either have to hold the shutter down, in this very cold wind, which isn't very ideal. Or I have to try and take a timed exposure... so I'm attempting to do that.

TROY CLINE

Minus 25 degrees and counting. This is just overwhelming. I'm freezing, but it's amazing to think that I'm standing actually in the Arctic, next to the Arctic ocean, and watching an aurora happen. I mean how many times in my life am I gonna be able to do that? This may be the last time I do this!

(Walking inside and door slams)

JONATHAN NICHOLS

So this is an example of the auroras that occur on the Earth. And it's a pretty spectacular example that occurred only last night up in Northern Alaska. The energy that drives the auroras and these processes ultimately comes from the Sun. What happens is the Sun is very, very hot, and it radiates not only heat and light, but it also radiates something called the "solar wind", which is a stream of charge particles which flow radially away from the Sun in all directions.

#### KIRSTI KAURISTIE

And these particles travel through space and come to the near-space of Earth. And there they have some interactions with the magnetic field of Earth. And consequently they precipitate to the atmosphere and collide there with atmospheric particles, and in this reaction you get some light. If you look at the auroras you first see a stable arc – it can be stable for hours – and then suddenly it brightens up, and you start to see these fascinating curls, rayed structures, and everything. And the question is, what happens in near-Earth space when this triggering happens?

And currently there are in space, some satellites, five satellites – a mission called THEMIS, which NASA is supporting, and these satellites make some observations in the space to get more information about these processes which cause this brightening.

#### NICHOLS

The science which is involved with the auroras is actually critical to the health of astronauts, the health of satellites in orbit, and communications systems. For example, when the Sun becomes very, very active, the radiation levels in space rise, putting astronauts at risk. It can short out satellites and communications, and also massive currents can be induced in pipelines and power lines across the northern latitudes. So it's crucial that we really understand the causes of the energetics involved in the auroras not just because they're pretty but because they really do affect life not only at the very northern latitudes, but people all around the globe.

#### RICHARD GLENN

A good thing this conference shows is a proof of concept that you can have a circum-polar meeting, with attendees from around the world. Some of them are attending here by traveling here directly. Others are attending from Sweden, using the gift of communication. There are some Fairbanks attendees. And so, we are a meeting location – that means what they want to learn can be studied here, and results of that kind of work can be transmitted from here, so it's the first time we're kind of at both ends of the research.

(Music)

Titles

#### JOHN COOPER

The Sun is... hasn't quite risen above the horizon yet. And it will do that tomorrow, on January 23<sup>rd</sup>, and so we should just see the Sun itself, poking above the horizon for about a half an hour or so, and that will be the first day of sunrise of this year, for this location.

HARRY BROWER, Jr.

First day the Sun come peaking over the horizon! (Chuckles.) After being in the dark for at least 60 days, first peak over the horizon, and everyone go... starts standing out there and shouting joy – ya know – “The Sun is back! The Sun is back!”

LOUIS MAYO

Oh, it is freezing out here! My watch says it's about 1:03 and thirty seconds. That means we've got roughly two and a half minutes till the official sunrise. We're already starting to see a sun pillar. We certainly see the light from the Sun, we see it reflecting off the bottom of the clouds – a beautiful, beautiful pinkish color, just gorgeous.

TROY CLINE

How about everyone give a cheer for the Sun?

(Cheers and whoops)

(Singing)

“Here comes the Sun, dah-dah-dadah...”

(Laughter)

“Where's the champagne?”

RICHARD GLENN

It's beautiful. This low-angle sunlight is nice to look at, and you appreciate it. I mean, I love it! When you see those colors in the sky. It wedges itself into daylight and wedges itself away. And there's none of this Sun slamming shut at the end of the day, like you have in a warm place.

(Music)

End titles