
Max Bronowicki

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00:00:00,750 --> 00:00:02,290
>> Lori Meggs: I'm here
with Max Bronowicki,

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00:00:02,290 --> 00:00:05,310
and he is from the University
of Bremen in Germany, and, Max -

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00:00:05,310 --> 00:00:05,460
>> Max Bronowicki: Hello -

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00:00:05,460 --> 00:00:07,260
>> Lori Meggs: First of all,
tell us about your experiment.

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00:00:07,260 --> 00:00:08,910
What is your experiment?

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00:00:08,910 --> 00:00:09,890
>> Max Bronowicki: Hello.

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00:00:09,890 --> 00:00:13,930
So our experiment,
capillary channel flow is,

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00:00:13,930 --> 00:00:17,190
so this is the project
and the experiment name,

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00:00:17,190 --> 00:00:21,000
capillary channel flow, which
is being conducted on board

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00:00:21,000 --> 00:00:23,190
of the International
Space Station.

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00:00:23,190 --> 00:00:28,040
So this is the cooperation

between German Aerospace Center,

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00:00:28,040 --> 00:00:31,780
NASA, our university,
University of Bremen,

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00:00:31,780 --> 00:00:34,840
and Portland State
University in America.

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00:00:34,840 --> 00:00:37,460
So our project, capillary
channel flow,

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00:00:37,460 --> 00:00:43,350
we are basically interested in
through it behavior in space

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00:00:43,350 --> 00:00:46,240
in a compensated
gravity environment.

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00:00:46,240 --> 00:00:51,820
And we particular, in particular
we focus on the fluid flow

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00:00:51,820 --> 00:00:54,050
in a capillary channel.

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00:00:54,050 --> 00:01:00,900
So just to give you an idea how
does the fluid behave different

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00:01:00,900 --> 00:01:05,650
on Earth and in space, I
could give you example.

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00:01:05,650 --> 00:01:10,720
So, for example, when
we drive a car on Earth,

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00:01:10,720 --> 00:01:12,610
yeah, we need the petrol.

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00:01:12,610 --> 00:01:16,500
So petrol is stored
in a car's tank,

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00:01:16,500 --> 00:01:19,150
and due to the gravitational
force,

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00:01:19,150 --> 00:01:21,060
it stays on the bottom
of the tank.

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00:01:21,060 --> 00:01:23,710
It's obvious and
simple to imagine.

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00:01:23,710 --> 00:01:29,120
So it's pretty easy to collect
the petrol from the bottom

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00:01:29,120 --> 00:01:33,460
of the tank and transport it
to the engine, but in space,

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00:01:33,460 --> 00:01:35,430
we have a bit different
situation.

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00:01:35,430 --> 00:01:37,250
There's no gravitational force,

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00:01:37,250 --> 00:01:40,070
which keeps everything
on the bottom.

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00:01:40,070 --> 00:01:44,760
So if we look at the spacecraft
or if we look at the satellite,

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00:01:44,760 --> 00:01:46,720
the [inaudible] which is stored

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00:01:46,720 --> 00:01:49,330
in a tank will not
stay on the bottom.

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00:01:49,330 --> 00:01:55,260
It will be spread, distributed
everywhere inside of the tank.

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00:01:55,260 --> 00:01:58,220
So it's a, it's pretty
challenging

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00:01:58,220 --> 00:02:00,810
to collect the proper
[inaudible]

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00:02:00,810 --> 00:02:03,680
and transport it
to the [inaudible].

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00:02:03,680 --> 00:02:06,690
So there are some
different devices, which are,

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00:02:06,690 --> 00:02:10,020
which do the job
and such as veins,

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00:02:10,020 --> 00:02:13,040
which are basically
capillary channels

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00:02:13,040 --> 00:02:14,480

which we are investigating.

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00:02:14,480 --> 00:02:17,590
What we do is a very
fundamental science,

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00:02:17,590 --> 00:02:19,510
very fundamental research.

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00:02:19,510 --> 00:02:25,690
So we are trying to understand
and describe the phenomena

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00:02:25,690 --> 00:02:27,860
which were not investigated yet,

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00:02:27,860 --> 00:02:31,270
and the [inaudible] management
system is one of the examples,

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00:02:31,270 --> 00:02:36,450
and, but the other applications
could be very generally proper

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00:02:36,450 --> 00:02:38,500
fluid management in space,

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00:02:38,500 --> 00:02:40,930
and not only proper
[inaudible] management system

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00:02:40,930 --> 00:02:46,750
but also life support system
and to astronauts which live

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00:02:46,750 --> 00:02:48,860
and work on board of ISS.

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00:02:48,860 --> 00:02:51,150

They use a lot of liquids.

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00:02:51,150 --> 00:02:54,980
Not only, it's not only drinking
water, and we are planning to go

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00:02:54,980 --> 00:02:58,690
to the Mars, probably with
a stopover on the Moon.

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00:02:58,690 --> 00:03:01,630
So we will need a lot of
liquids, and we need to be able

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00:03:01,630 --> 00:03:04,710
to manage them and
transport them.

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00:03:04,710 --> 00:03:06,590
So this is what our
research about,

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00:03:06,590 --> 00:03:09,630
but there are also
some Earth application.

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00:03:09,630 --> 00:03:14,360
So such as [inaudible]
devices and variety

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00:03:14,360 --> 00:03:18,100
of micro channels used
in a biomedical industry.

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00:03:18,100 --> 00:03:21,470
So all micro channels where
this capillary effects

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00:03:21,470 --> 00:03:25,990
which we are investigating

play a big role, and, yeah,

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00:03:25,990 --> 00:03:29,760
we've got some results, and it
will be not possible to perform

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00:03:29,760 --> 00:03:32,520
such a huge study here on Earth,

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00:03:32,520 --> 00:03:36,090
and NASA gave us this
wonderful opportunity

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00:03:36,090 --> 00:03:38,940
to perform this long-term
experiments

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00:03:38,940 --> 00:03:41,980
in space, which is great.

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00:03:41,980 --> 00:03:44,130
And you asked about the results.

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00:03:44,130 --> 00:03:45,110
So -

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00:03:45,110 --> 00:03:45,610
>> Lori Meggs: Right -

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00:03:45,610 --> 00:03:47,260
>> Max Bronowicki: I
don't want to go too deep

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00:03:47,260 --> 00:03:48,560
into the details now -

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00:03:48,560 --> 00:03:49,670
>> Lori Meggs: Yeah, but
you do have results -

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00:03:49,670 --> 00:03:53,410
>> Max Bronowicki: Yes, but I
would like to mention that we,

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00:03:53,410 --> 00:03:57,840
there is a perfect
[inaudible] between the TRE

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00:03:57,840 --> 00:04:01,270
and our predictions and
experimental results,

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00:04:01,270 --> 00:04:04,800
which is great, and
that gives us a lot

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00:04:04,800 --> 00:04:06,830
of motivation for further work.

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00:04:06,830 --> 00:04:11,320
What I would like to say that
we really appreciate this help

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00:04:11,320 --> 00:04:15,790
of NASA, and we do enjoy working
with NASA together, and we'll,

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00:04:15,790 --> 00:04:21,130
we are looking forward to
be, to do more experiments,

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00:04:21,130 --> 00:04:23,880
and we do some real
serious science,

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00:04:23,880 --> 00:04:26,300
but we have fun, which is great.

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00:04:26,300 --> 00:04:28,760
Mainly thanks to NASA
and to [inaudible] team.

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00:04:28,760 --> 00:04:29,490
So -

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00:04:29,490 --> 00:04:30,400
>> Lori Meggs: Terrific,
and he's going

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00:04:30,400 --> 00:04:31,350
for his Ph.D. So [inaudible].

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00:04:31,350 --> 00:04:34,030
So good luck with that, too.

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00:04:34,030 --> 00:04:35,800
Maybe this experiment
will help that along.