

Title of Session:

Moderator: Jeff Cooper

Guest Speaker: Michael Mealling

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Room: Science Resources K-20+

JeffC: Before I introduce our guest speaker today, if everyone could type in a brief introduction.

KhairiltiZ: I'm going to be an observer today. If that be ok. I'll just sit at the back and watch.

JeffC: Everyone is welcome to sit back and relax... well... except for Michael! I am Jeff Cooper, on Helpdesk here and I also facilitate this Science Resources Group.

AaronCo: middle computer and science teacher

AaronCo: middle school

HelenK: I am from Quesnel BC Canada and I work with adult education and assist in the k-12 area with compiling and sharing resources.

FredK: Hi, I just now joined this group

NinaH: Hi! My name is Nina and I'm a 6th grade science teacher in Maryland

DavidWe: I'm David Weksler. I help teachers get more comfortable with educational technology. I'm in New Jersey near New York City

JimHi: From Edgewood Kentucky...7th Grade Science

FredK: I'm with the Pushmataha County Literacy Council

JeffC: OK. I would now like to introduce our guest speaker today, Michael Mealling of Masten Space.

JeffC: I have begun a Discussion thread regarding his company, so if you wish to reply, you may click on Discussion and get an overview.

JeffC: Michael is here today to talk to you about his company, which has the very ambitious idea of sending payloads into space for K-12 educators at a fraction of the current cost.

MichaelMea: good evening everyone... I've added several links to the whiteboard. The best one to start with is the presentation pdf: <http://masten-space.com/k12presentation.pdf>

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Science K-20+ Whiteboard

Masten Space Space Systems website:
<http://masten-space.com/>

Launch video:
<http://masten-space.com/ms-movie.mpg> (19M)
<http://masten-space.com/ms-movie.mov> (8.6M)
<http://masten-space.com/ms-movie.wmv> (9.3M)

Presentation PDF:
<http://masten-space.com/k12presentation.pdf>

To contact Michael Mealling:
mmealling@masten-space.com

Survey:
<http://masten-space.com/surveys/index.php?sid=1>
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JeffC: Please hold the Ctrl key down when clicking the above link.

MichaelMea: As Jeff said, we're working on making suborbital space affordable enough for the K-12 community to have regular and reliable access.

DavidWe: What do you envision launching, Michael?

MichaelMea: The vehicle we are building right now will be able to take 100kg of payload to between 100 and 500km.

MichaelMea: David, mostly science experiments ranging from the simple (what happens to an egg in vacuum? How do oil and water mix in zero-g) to the complex (space based astronomy, earth observation analysis for environmental studies)

DavidWe: Any idea about the price tag? Cost per kg?

AaronCo: First this is awesome, 2nd when do these flights take off?

MichaelMea: The way we're able to make this so cheap is that our rockets are completely reusable. We're basically trying to make space work the same as airplane operations.

MichaelMea: David, \$25,000 per 100kg flight. We will be selling those in 1kg payload increments. So \$250/kg

DavidWe checks Michael's math

DavidWe nods

MichaelMea: Aaron, first commercial flight happens during the first quarter of 2008. We will be flying long before that but those won't be full space flights.

AaronCo: when do the flights begin?

MichaelMea: so if you want to be first, you have about a year and a half to plan....

AaronCo: when will students have access?

JimHi: What technical support would there be?

MichaelMea: student payloads are welcome to fly on the first commercial flights... we already have one school system interested.

DavidWe . o O (leave the engineering to Masten Space)

MichaelMea: Jim, we are working with NASA Ames and others to create a payload interface that is very similar to what Lego Mindstorms is doing with robotics....

DavidWe wonders if the launch vehicles are rockets or...?

AaronCo: will schools have to send you the "payloads"

AaronCo: equipment, materials, recording devices, etc?

NinaH: Michael, how many payloads can each launch take?

MichaelMea: David, yes, a VTVL rocket. There is a video on the whiteboard you can download.

DavidWe . o O (send the check, first, Aaron)

AaronCo gives thumbs up

DavidWe: Are you an engineer, Michael?

MichaelMea: Aaron, yes, the school sends us the payload, we fly it, charge your credit card (or whatever) and then send the payload plus the data back to you.

AaronCo: cool

MichaelMea: David, I'm head of marketing but I was a computer science engineer for the past 15 years.

AaronCo: like subzero

DavidWe smiles

DavidWe: But not a rocket scientist...

MichaelMea: Aaron, although we will be flying out of any spaceport available so the students are welcome to come out to watch a flight as a field trip.

AaronCo: restrictions on payload manifests?

DavidWe: Where will the launches take place, Michael?

MichaelMea: David, nope. I leave the engineering to the engineers... although I do fly my own high powered rockets....

DavidWe: No plutonium, Aaron

MichaelMea: David, right now it's looking like the new New Mexico Spaceport, possibly Kodiak Island in Alaska, possibly a new spaceport in Florida (south of Jacksonville) and hopefully Wallops Island, VA

NinaH raises her hand

AaronCo: lol

MichaelMea: Nina?

MichaelMea: heh

NinaH: How many payloads can each launch take?

MichaelMea: 1 100kg payload..... or 100 1kg payloads.... the payload carrier can handle 1kg, 10kg, 25kg, and 50kg 'slot' sizes.

DavidWe . o O (volume restrictions?)

JeffC: but wouldn't there also be a "size" limitation?

DavidWe wins

MichaelMea: David, there are some but since this vehicle will be scaled up for suborbital tourism class flights we have LOTS of volume....

DavidWe: Good, then we CAN get Jeff from Portland to San Diego with one of your rockets

DavidWe believes Jeff is right about 100 kg

MichaelMea: I'm asking the engineer now exactly what the payload volume is...

MichaelMea: we will start flying suborbital tourism flights in 2009.

DavidWe: Way cool!

AaronCo: are there restrictions on the contents of a payload, other than non-explosive?

MichaelMea: there are rules setup by the National Academy of Science for how you treat live specimens during space travel. Beyond that no explosives, no radiologicals, nothing that could harm the vehicle. There are restrictions on earth imaging due to treaties so you'd have to get NOAA licenses for taking pictures of the earth. We can help you with that....

NinaH: Do you know of any grants that could help fund this?

MichaelMea: Nina, I've heard of several: state Space Grant organizations are one of the easier ones. Beyond that if you're at the 1kg level \$250 is something you can sometimes easily get from a local organization. But beyond that we are actively looking for partner organizations that can help with the fundraising aspects.

JeffC thinks it would be a good idea if Masten put several links to grant sites on their site.

MichaelMea: the last slide on the powerpoint is us begging for help from the K-12 community. We're looking for folks to help us develop course materials, etc....

AaronCo: something you might have, since you listed this in your presentation as wanting suggestions from the academic world...

NinaH: Yeah, I saw in the PDF file that you are looking for help fundraising and lesson planning

MichaelMea: Jeff, I'm compiling a list and hopefully will have that up soon...

AaronCo: make a public list of the payloads, along with contact infor ...

NinaH . o O (I can help with the lesson writing. I've already written lesson plans for NASA.)

AaronCo: so schools can collaborate with those who were fortunate enough to send a payload

JeffC: excellent Michael and Nina!

MichaelMea: cool! yea, we're definitely willing to offer free rides for anyone who helps us develop stuff!

MichaelMea: Aaron, yes, we fully expect schools from around the world to collaborate on payloads.

AaronCo: I was saying that you could add that forum onto your site for access

MichaelMea: yep! we'll be building a portal for helping coordinate all of that... (although I may end up bugging tappedin.org for some help there!

JeffC: why not just have a group room here Michael?

BjB cheers..I hope so, Michael!

JeffC: I already started a discussion thread here, but having your own room here is fine... and *free*.

MichaelMea: from the engineer: the payload bay will be a little more than 1 square meter of room.

AaronCo: will your company be sending up its own payload for data collection and dissemination?

FredK: I'm wondering about the carrier. I think you mentioned recycling it.

JeffC: it lands

MichaelMea: Aaron, probably not.... we really want to stick to the launch business and not get into the science side to much.... we just don't have the expertise in house for that.

AaronCo: fine

MichaelMea: Fred, yes, the entire vehicle lands where it took off from.... 100% reusable.

AaronCo: do you have personnel who can visit with a school about this project/

JeffC: which is really amazing to me... because every time I played one of those retro rocket land on the moon games... I always crashed... of course... I'm no rocket scientist!

FredK: Thanks. By the way, volume needs one more dimension

MichaelMea: Aaron, not currently no (only 7 of us in the company! . I hope to have that ability starting in 2007 sometime though.

AaronCo: can I apply for the job?

MichaelMea: Fred.... sorry.... cubic meter...

JeffC: my guess is we can continue to have masten people meet here Aaron, and of course, there are ways to facilitate video hookup as well (skype, horizon, etc.).

MichaelMea: Aaron, sure! we won't have the funds for that position until first of next year but we're always looking for people ready to slot in!

AaronCo: some schools firewalls prevent skype and other similar programs from running

DavidWe: Often it is easy to get the school district tech folks to allow access to TappedIn, Aaron, it's pretty easy to open up the one port that is needed

MichaelMea: The one thing you guys could do to help is fill out our survey. The hardest thing I'm currently doing is trying to convince investors that the K-12 community is interested in this.

NinaH: where is your office located?

AaronCo: you have never worked in Los Angeles Unified School district..

AaronCo: it has been tried

MichaelMea: Santa Clara, CA.... I'm in Atlanta though..... we will be moving to Mojave, CA this summer.

MichaelMea: <http://masten-space.com/surveys/index.php?sid=1>

MichaelMea: that's the URL to the survey.....

DavidWe nods

DavidWe: Michael, do you know about the NECC conference?

MichaelMea: this isn't public yet but we will be handing out a few free 1kg payload slots for survey responses.... I just haven't figured out how many to hand out yet.

MichaelMea: David, nope... NECC?

DavidWe . o O (National Education Computing Conference)

AaronCo: you and your group would rock and roll at an NECC event

DavidWe . o O (July 4-7, 2006 in San Diego - I'll be there talking about TappedIn)

MichaelMea: I am planning on doing the national science teachers conference this year....

NinaH: You are more than welcome to hand a slot to me, I teach at a magnet middle school near DC!!!

DavidWe: Have any lobbyist friends, Nina?

NinaH: I was at a NSTA conference in Nashville

DavidWe smiles

NinaH: Not that I know of, sorry

MichaelMea: Nina, yea, I tried making that one but the FAA kind of got in the way.

AaronCo: NECC is like all of the state tech conferences, but on steroids

DavidWe: <http://center.uoregon.edu/ISTE/NECC2006/>

MichaelMea: We will be competing for the Lunar Lander Challenge at this years XPRIZE Cup in Las Cruces, New Mexico so we're extremely busy trying to get the licenses done on that.

DavidWe: That's the URL for the upcoming conference

MichaelMea: thanks!

DavidWe: ISTE (International Society for Technology Education) is the big group that sponsors NECC

AaronCo: will your company have plans for extended launches/orbits of earth

MichaelMea: that's one of the things we think we really help with: because a launch is a great combination of science and engineering.

DavidWe: just make sure the O-rings are high quality

MichaelMea: Aaron, yep.... once we have the humans to suborbital vehicle done in 2009 we work on stacking them for a Two Stage To Orbit vehicle. Both stages land vertically and are 100% reusable.

MichaelMea: David, yep! and don't launch when it's below freezing!

DavidWe nods

AaronCo: it would be awesome for your rocket to dock with the space station and return with "stuff" from them as well

FredK: What time in space are we talking about?

DavidWe . o O (They could bring clean laundry to the astronauts)

MichaelMea: Aaron, we have thought about that (we are even a sub-contractor on one of the COTS proposals). But the overhead of visiting ISS is really expensive

AaronCo: just an idea, and the price does seem to be dropping...

AaronCo: so maybe in the future

MichaelMea: Fred, for suborbital flights it roughly goes like this: 100km gives you about 1.2 minutes of zero G, 300km is 4 minutes, and 500km is 9 minutes.

FredK: thanks

DavidWe: Michael, I interact with a fair number of teachers. If I meet folks who might be interested, what's the best URL to give them?

AaronCo: once it is in orbit, do you maintain directional control?

DavidWe . o O (for more information)

MichaelMea: David, just the main page: <http://masten-space.com/> I'm going to be adding a K-12 specific page in the menu....

DavidWe nods

MichaelMea: Aaron, definitely..... can't land without an RCS.

NinaH . o O (RCS?)

DavidWe smiles

DavidWe . o O (acronym time, folks)

AaronCo: I was just going to ask, Nina, thanks for reading my mind

MichaelMea: Reaction Control System.... those little rockets on the shuttle that are used to point and steer.

NinaH laughing

MichaelMea: also, feel free to point people at that presentation PDF....

DavidWe wants to ask one of his favorite questions

DavidWe nods

NinaH: That was very helpful, just skimming through it

MichaelMea: David, favorite question? What is the relative velocity of an unladen swallow?

DavidWe . o O (Why is NASA a four letter government agency?)

DavidWe: That's a good one, though, Michael

DavidWe smiles

JeffC: African or European swallow?

JeffC: or one that was shot in the beak by Dick Cheney?

BjB rolls her eyes

NinaH . o O (wonders where she is)

DavidWe: Bj, we're boys! What did you expect

DavidWe smiles

DavidWe: And we ARE speaking rockets!

BjB hopes the 'boys' stay sort of on topic?

NinaH: Hey, there is a lady present!

DavidWe laughs

DavidWe knows that Bj saw "The Right Stuff"

MichaelMea: was anyone able to download the movie?

DavidWe hasn't tried yet

NinaH: Didn't try it yet

AaronCo: I am right now..

AaronCo: cable connection if anyone wants to race

MichaelMea: the artist that did that also did Firefly and BSG.... won an emmy for it in 2003.....

DavidWe: cool

MichaelMea: it's probably the best for giving you an idea of the capability....

DavidWe: Michael, do you get around to schools to speak about this?

MichaelMea: we can even open up the payload bay in space and kick your payload out....

AaronCo: isn't that littering?

AaronCo: jk

MichaelMea: David, I'm working up to that. Right now I'm 100% responsible for all of our FAA licensing and investment search so visits like that will have to wait until later this year.

DavidWe nods

MichaelMea: Aaron, well it is a little... if you want to re-enter separately you have to have your own license from the FAA. We can also help you with that.

MichaelMea: here's a question for you guys: I've asked local schools to do just that and I have yet to get a return phone call. What's the recommended way of breaking through the chaos that is a teacher's or curriculum manager's daily life?

AaronCo: is there supposed to be sound with these videos?

MichaelMea: offer to buy them drinks?

MichaelMea: Aaron, nope..... getting the license to distribute sound with a video like that is actually kind of insane.....

NinaH: Maybe come to a Science Department Meeting

FredK: offer them smoke detectors

AaronCo: ok, I thought I was headed for a new sound card!

MichaelMea: Nina, they have outside visitors at those?

NinaH: If the Science Department Chairs all meet once a month, like they do in our county, meet with them.

JeffC: actually Michael, there is a lot of open source music online.

MichaelMea: neat... yea, I'll check on that....

NinaH: Absolutely!

AaronCo: you might consider aiming for a smaller school district with a more progressive view of education..

JeffC: you might want to start with <http://www.ourmedia.org>

NinaH: we do, at least

MichaelMea: Jeff, thanks!! (love open source content stuff....)

MichaelMea: we also seem to get a lot of interest from homeschoolers....

NinaH: I work for a LARGE county in Maryland, Montgomery County Public Schools. You might also want to contact the head of the science department in a large county. Large County = \$\$\$

DavidWe: Always - they are out on the Net LOOKING for good stuff

AaronCo: for those of you attempting to down load, the file size is huge, even without sound

DavidWe has been to Montgomery Blair (MD) high school

AaronCo: larger county can equal more red tape

MichaelMea: Nina, yea, I'm in Cobb County, GA (yes, that Cobb County) which is a suburb of Atlanta. I'm always trying to find contacts in those districts.

DavidWe: Very high level math/science high school, Michael

MichaelMea: David, I'll try that one. I end up in the D.C. area a good bit these days.

AaronCo: but most schools have a discretionary spending account, especially for purchases under \$1000 dollars...

AaronCo: in LAUSD that is

MichaelMea: Aaron, \$1000 is a 4kg payload... the going price for that through NASA is about \$350,000

MichaelMea: our goal is to let kids do what only NASA scientists have been able to do....

DavidWe: One of my colleagues, Ihor Charischak, runs a wonderful project - The Noon Day Project - which re-creates an experiment done by Eratosthenes to measure the circumference of the earth

DavidWe: <http://www.k12science.org/noonday/>

AaronCo: hmmm, what I mean is that for \$250.kg, that would be well within the spending budget for a school in LAUSD..

DavidWe: By having schools around the world contribute data, they can help get a more accurate measurement

NinaH: The head of the Science Department is named Michael Szesze - Michael_J_Szesze@mcpsmd.org OR 301-279-3421

MichaelMea: (my desktop is now full of windows open to all sorts of really cool sites!)

NinaH: You are more than welcome to throw out my name, he knows me

DavidWe: Nice name...Szesze?

DavidWe smiles

JeffC: the key here people is that Michael's company seems to have an excellent plan at shooting *something* into space for a reasonable price. however, they need educators to figure out what kind of science experiment(s) to do... that is where the K-12 people come in... and where grants can be written.

DavidWe: Yes, Michael

DavidWe: You'll get a transcript of this conversation

MichaelMea: cool.... lots of good stuff here....

JeffC: I'd like to thank Michael for coming, and everyone else as well.

DavidWe wants to thank Michael for tonight's presentation

AaronCo: see how spider webs are spun differently in zero-G,...

JeffC: I have opened a Discussion thread here on this subject and invite people to reply.

AaronCo: that sort of thing?

MichaelMea: Aaron, in orbit, yes... hard to get a spider to spin a full web in 10 minutes.

JeffC: yes Aaron... exactly

AaronCo: see which weighs more in zero-g, a pound of brick or a pound of feathers?

BjB: Thanks, Michael. Very interesting discussion

JeffC: especially a pissed off spider that just underwent several Gs

AaronCo: like that..

MichaelMea: also, be sure to check our blog, we post engine test videos and build pictures there about once ever week or so.

FredK: Good session and goodluck/lots of hard work.

MichaelMea: thanks everyone!

NinaH: Thanks Michael, it was nice to meet you on the Web!

DavidWe: Jeff, Michael, we should do this again

MichaelMea: sure.... name the time and I'll be here.

DavidWe hopes Jeff's scheduling assistant can get to work on that

BjB waves goodnight

MichaelMea: I'm going to sign off now to go eat dinner..... g'nite and thanks again for all the suggestions!

DavidWe: Take care, Michael. Thanks again!