

12:03:33 From TOMMY RAY : is there any audio currently?

12:03:49 From Bagher Mahdavi : yes

12:03:53 From Ken Sharp-Knott : The meeting will begin at 12:05

12:03:56 From Phil Kornbluth : not yet

12:04:15 From Ryan McKay : We need background elevator music?

12:04:30 From WLJ : Wouldn't hurt

12:04:31 From Nicholas Eddy : I think we do, Ryan

12:04:32 From Bagher Mahdavi : may be

12:04:52 From Bagher Mahdavi : a gradient sound inside the MRI magnet maybe

12:06:40 From Dan Iverson : The IVAN team sponsors an NMR forum on Slack called IVAN-Spinsights. It is a place where NMR people can discuss anything related to NMR. Membership is open to anyone, not just Varian/Agilent users. You can join the 499 current members with this link  
[https://join.slack.com/t/ivan-spinsights/shared\\_invite/zt-fbfzblja-vET5Gp5VsQdoCFbeBrNAfg](https://join.slack.com/t/ivan-spinsights/shared_invite/zt-fbfzblja-vET5Gp5VsQdoCFbeBrNAfg)

12:10:19 From TOMMY RAY : slack link is expired

12:12:09 From Hari Krishna Santhapuram : Is there recording available for the meeting?

12:12:54 From Jon Webb : The meeting is being recorded and available on the IVAN website [www.ivanmr.com](http://www.ivanmr.com)

12:13:25 From Hari Krishna Santhapuram : Thank you!

12:13:42 From Bagher Mahdavi : Thanks a lot

12:15:46 From Ken Sharp-Knott : Please mute your microphones

12:17:56 From Michal Respondek : Is helium export from Russia 'free' from international sanctions?

12:18:52 From Bagher Mahdavi : I can deliver liquid helium from Turkey

12:19:06 From Bagher Mahdavi : in bulk

12:22:49 From Dan Iverson : Could you try this link for IVAN-SpinSights  
[https://join.slack.com/t/ivan-spinsights/shared\\_invite/zt-fbfzblja-Ne9\\_IGz3V8bbN\\_cbttwapw](https://join.slack.com/t/ivan-spinsights/shared_invite/zt-fbfzblja-Ne9_IGz3V8bbN_cbttwapw)

12:23:30 From Ping YU : The new link works

12:32:15 From Serge Lavoie : what about North America Helium (NAH)?

12:33:06 From MR Resources Inc to Serge Lavoie(Direct Message) : he spoke about North America Early on in the presentation

12:33:08 From Normand Cyr : marginal supply at the moment i suspect

12:34:30 From Craig Bettenhausen : NAH is saying they have 60 million cubic feet of capacity now and they expect to double that over the next year.

12:39:33 From Ryan McKay : Company in Saskatchewan

12:39:57 From Josh Kurutz : IS BLM/Messer planning to replenish the strategic helium reserve after the crisis subsides?

12:40:32 From Phil Kornbluth : no

12:43:53 From Walt Massefski : Can you break down the components of the shortage in terms of 1) helium gas supply issues vs. 2) gas to liquid conversion vs. 3) liquid transportation and delivery?

12:44:38 From Phil Kornbluth : Mostly 1)

12:45:05 From Michael Goger : what about exploration for and development of new fields? Any info?

12:45:06 From John Kelly : Bruker He recycling was ~\$75k last time I inquired about it

12:45:41 From Ryan McKay : Is the Bruker offering only high compression not liquefaction?

12:46:43 From John Kelly : That was for compression, yes. I'm not sure if they also offer liquification or not

12:46:49 From Renee Happs, NREL : When we spoke to Bruker it was recycling only not liquification

12:49:20 From David Peyton : Might someone speak about MRI-related impacts? Are hospitals in trouble? How much He use do they have (including factoring-on recycling), relative to NMR systems?

12:49:27 From Craig Bettenhausen : c\_bettenhausen@acs.org is my email address; 202 309 6612 is my phone. Please contact me if you've signed or been asked to sign no-recycle agreements--if you need me to keep you anonymous, I can do that.

12:55:20 From Brian Antalek : is it safe to allow 300/400 MHz systems to quench on their own rather than a controlled de-energization?

12:55:51 From Edward Sherer : For PNNL, is it cost prohibitive to purchase helium to maintain instruments or is it that you are not able identify any secondary vendors?

12:56:06 From Bagher Mahdavi : the magnet burst disk will raptured

12:56:08 From Aleksandr Bazvanov : apart of the price, we can help with helium

12:56:23 From Aleksandr Bazvanov : info@he24me.com

12:56:30 From Phil Kornbluth : Lots of exploration going on now. Many start-ups.

12:56:33 From Bagher Mahdavi : and may damage to magnet inn some cases

12:57:05 From Scott Prentice : Will MRIs be prioritized over NMRs

12:57:31 From Bagher Mahdavi : in Helium Supply?

12:57:38 From Bagher Mahdavi : I think No

12:57:57 From Bagher Mahdavi : as helium seller sell to NMRs more expensive

12:58:07 From Bagher Mahdavi : NMR need small amount

12:58:13 From Nancy Washton : Medical uses are prioritized over research, as are defense needs.

12:58:37 From Bagher Mahdavi : MRI needs at least 400 L in every refill

12:58:55 From Bagher Mahdavi : nmrs Need not more than 100 L

12:59:03 From Josh Kurutz : @Craig, do you of any regional hub-and-spoke systems working today?

12:59:16 From Bert Heise : Q (Brian Antalek): is it safe to allow 300/400 MHz systems to quench on their own rather than a controlled de-energization?

12:59:23 From Bagher Mahdavi : shipping and logistic is dominant in NMRs rather than MRI

12:59:30 From Dan Holmes : one standard cylinder of UHP helium will yield ~13 liters of liquid helium

12:59:59 From Craig Bettenhausen : None that I can be 100% confident of, but I've started to follow up chatter of such a network forming in Boston/Cambridge

13:00:38 From Robin Stein : who would do transportation in a hub-and-spoke system?

13:00:41 From Bert Heise : Q (Brian Antalek): is it safe to allow 300/400 MHz systems to quench on their own rather than a controlled de-energization?

13:00:53 From Bert Heise : Damn, cannot use „Return“ in Chat...

13:00:59 From Bert Heise : Can

13:01:17 From Bert Heise : Can't even delete a Chat entry...

13:02:08 From Ryan McKay : Most people with liquefiers are already busy with their usage/experiments.

13:02:25 From Erica Brendler : But the supply of He gas has also been cut down.

13:02:39 From Josh Kurutz : Hub-and-spoke transportation? I don't know who would take care of that. It's definitely an issue, but haven't checked it out in greater detail.

13:03:02 From Ulrike Werner-Zwanziger : Can you please comment on the legality of transporting liquid helium. We were told we could not even bring it across the street on foot, let alone transportation?

13:03:57 From Josh Kurutz : I'm scoping out the potential for a hub-and-spoke system around greater Chicagoland. I'm checking what sort of recycling facilities might be at Argonne national Labs. Anyone in the area interested? Contact me: jkurutz@uchicago.edu

13:04:11 From Ryan McKay : We did that with NAH and Linde

13:04:35 From Nancy Washton : Argonne doesn't have a helium recovery system for their magnets.

13:05:17 From Nancy Washton : Plus the Advanced Photon Source (APS) user facility at Argonne is in a rough spot needing helium

13:05:24 From Lisa Tokmic : Why are vendors for helium balloons still able to purchase it, when medical, research and defense are being prioritized?

13:05:26 From Bob Berno : I would think anyone who is licensed to transport compressed gas cylinders must be able to transport liquid helium.

13:05:51 From Dan Holmes : allocations by one of the majors are by atom of helium and gas can be harder to get

13:05:59 From Robert Stueber : What would a typical price reduction look like on buying gas helium vs liquid?

13:07:00 From Dan Holmes : My experience is that the gas cost is comparable to liquid

13:07:02 From Marcel Schleusner : For us in the EU Helium gas is not really that substantially cheaper...

13:07:11 From Phil Kornbluth : no price reduction or minimal for gas

13:07:38 From Bert Heise : Regarding letting „run down“ 300/400 MHz magnets with no helium: The magnet won't have any way to deposit its stored energy into heat other than heating up its quench resistors really hot which might kill stuff inside the magnet. Most critical with shielded 400 magnets, less so with unshielded 400 & 300s.

13:08:02 From Charles Fry : We are under allocation for gas supply as well as LHe. Is impacting GC and GC/MS users here.

13:10:50 From Marcel Schleusner : Could that document also be shared here?

13:11:09 From David Gardner : Allowing the magnet to dry quench is the most risky way of quenching a magnet. If you never want to recover the magnet then you can do it but if you ever want to reinstall the magnet then I would have it run down. The stored heat in the resistors can damage the coil/shims. Most times you will either have a magnet that won't come back on line or it will have drift issues.

13:12:47 From Bert Heise : @David Gardner: Agreed - try to avoid whenever possible...

13:13:21 From Ping YU : What is the cutoff pressure on the Exhaust Valve?

13:13:36 From David Gardner : Yeah, it's a last ditch option only. I have been giving reduced rates for discharging provided I get the contract to reinstall.

13:14:47 From Cathy Clewett : Can the exhaust valves with the blue ends remain connected during fills?

13:15:17 From Bert Heise : Btw. that overpressure valve must not be too far away from the magnets! I have seen recycling systems with literally hundreds of meters between magnets and the balloon/liquefier...

13:15:50 From Josh Kurutz : What does APD stand for again?

13:16:14 From David Gardner : automated pressure device

13:16:19 From Bert Heise : Safest way: Have an overpressure valve next to each magnet or a lab full of magnets

13:16:31 From Ping YU : how to turn off APD (before HE refill)?

13:16:35 From Kristen Varney : Atmospheric pressure device

13:16:36 From Cathy Clewett : Automatic Pressure Device

13:16:38 From David Gardner : Keeps the magnet at a consistent overpressure

13:16:44 From Ryan McKay : manostat?

13:16:53 From Josh Kurutz : Is the APD the same as a manostat?

13:17:02 From Bert Heise : Yes

13:17:06 From Bob Berno : There should be a power switch on your APD. You can switch it off, or unplug.

13:17:20 From Ryan McKay : Are they still like \$10k?

13:17:51 From David Gardner : I would power it down about 1 hour prior to the helium fill and allow it to vent slowly.

13:18:15 From David Gardner : Might be more, but \$10K sounds reasonable.

13:18:38 From Ryan McKay : We just drop the regulated pressure before fills. We don't turn off. Then turn back up after.

13:18:40 From Geoffrey Akien : Any supplier recommendations for that 70 mbar overpressure valve?

13:19:33 From David Wassmann : four 4-8 magnets, how big of a balloon is needed (approximate physical dimensions)?

13:20:23 From Ruud Aspers : is the adsorber sufficient to clean the helium flow from the oil mist?

13:22:30 From Bert Heise : Overpressure valves: for example [iceoxford.com](http://iceoxford.com)

13:23:26 From Bert Heise : Original manufacturer: [circlevalve.com](http://circlevalve.com)

13:24:42 From Ping YU : We have a 800US2 pumped magnet, and the flow rate is 110ml/h, is this the real boil off rate of the this magnet?

13:26:17 From Evgenii Kovrigin : If your heater is always on - the pumps are the only exhaust of he boil off. If your heater is not normally on - APD also exhausts. However, pumps are still dominating

13:27:02 From Gert Patello : Are NMR vendors developing NMRs that don't need He?

13:27:03 From Darcy Burns : Can the HelioSmart system be hooked into older Oxford, J, V / A magnets? (i.e. cross-vendor compatible?)

13:29:25 From Josh Kurutz : Razva, on the Heliosmart system, what is the 50m of tubing made of?

13:30:39 From Ken Sharp-Knott : NMR's that don't require helium are a long way off and the required technology does not presently exist.

13:30:47 From Paulo Falco Cobra : So the Heliosmart only captures and compresses He but you still need a liquefier and to transfer it back to the magnet yourself? Or am I missing something?

13:30:56 From Ken Sharp-Knott : That's correct

13:31:04 From Ryan McKay : Nope you're dead on.

13:31:20 From Ryan McKay : Why no liquefier? How are we to use this?

13:31:38 From Erica Brendler : Which electrical supply is needed for He-Smart?

13:32:22 From Raymond Bret Clark : Are HelioSmart compressor only compatible with Bruker magnets?

13:32:37 From Bert Heise : @David Wassmann: well, you need the balloon mainly to capture the gas during helium refills where a lot of gas is „produced“ in a short time. 750 l per liter of liquid helium are generated.

13:32:38 From Josh Kurutz : The idea with the Heliosmart system is to partner with someone to liquefy it. ALSO, some campuses (like ours) have NMR systems in different places across campus, and we don't want to have multiple liquefiers.

13:32:39 From Ken Sharp-Knott : HelioSmart should be able to work with any magnet

13:32:47 From Brian Antalek : does the heliosmart provide ultra high purity HE for use with GC systems?

13:33:46 From Catherine Deborde : How expensive are the maintenance cost of HelioSmart ? Is there annually compulsory contract like for cryoprobe ?

13:34:16 From Erica Brendler : Where ist the Bruker test station? I was told that it is not allowed in Germany to place a 12-bundle into a lab? (as on the Foto)

13:34:27 From Juraj Bella : a bit more technical data about Heliosmart: <https://www.bauer-kompressoren.de/en/products/industry/air-cooled-compressors/90-350-bar-helium-g-series/60-lmin-g60-v/>

13:34:36 From Ken Sharp-Knott : The magnet boil off should be exceptionally pure. I would think it could be used GC or LC

13:34:52 From Bert Heise : Running a helium liquefier is quite expensive (needs lots of electricity, requires maintenance like a cryoprobe!). Just compressing helium (like with Heliumsmart) is much cheaper but you need to sell/send your compressed helium gas somewhere else.

13:36:02 From Bert Heise : The \*boil off\* itself is pure, but running it through a compressor makes it rather impure...

13:38:24 From Peter Dormer : What type of connector/fittings are used between the Heliosmart and the gas storage rack?

13:38:43 From Bert Heise : @Erica Brendler: Indeed you normally would need to store the gas bundle outside - or inside a specialized explosion-proof cabinet (not sure if it exists for a multi-cylinder pack).

13:40:32 From Josh Kurutz : See:  
<https://www.acs.org/content/acs/en/policy/memberadvocacy/issues.html#/takeaction/>

13:45:50 From Richard Lewis : We are in the process of installing a helium recovery system. Security of supply was one of my arguments to get funding, and for me that meant a liquifier was a key requirement. It does use a lot of electricity – but looking holistically, much less energy than that used for purifying, liquifying and transporting non-recycled helium

13:47:17 From Marc ter Horst : replace seals on an old magnet?

13:47:52 From Bert Heise : On top of that, most recent Bruker and Varian/Agilent magnets are not delivered with (dis)charging rods - so no way to discharge it yourself (magnet specialists like MRR or us - Spin-Doc - do have most charging rods though).

13:48:01 From Bert Heise : (Spin-Doc)

13:49:04 From Renee Happs, NREL : Does anyone have any idea what the maintenance cost is for a recovery system?

13:49:21 From David Gardner : Correct, Bruker stopped selling magnets with charging leads around 2004. There are a few of us out there that have the appropriate charging leads and power supplies to do this work safely.

13:49:53 From Bert Heise : Agree with Jon - better an attempt to discharge it rather than having a guaranteed quench!

13:50:14 From David Gardner : Agreed Bert!

13:50:51 From Josh Kurutz : I've been advised to "be careful" when filling a magnet close to its minimum level. What does that mean, exactly? Is there anything that needs extra-special attention? Transfer rate? depth of transfer line?

13:52:01 From Bert Heise : When push comes to shove: Still better try to discharge a magnet while helium is still in it (even if it's less than recommended) rather than letting it quench on empty helium!

13:52:39 From Monika Ivancic : My guess is that if you 'rock' the magnet when He level is super low, there's a chance the coils would get exposed and quench? I let my Oxford magnet get to 20%...

13:52:59 From Mark Swanson : Are there any caveats to de-energizing Magnex magnets? Specifically 500 MHz. I've heard they have a tendency to not come back to field.

13:53:27 From Bob Berno : @Josh: You want to avoid any "warm" helium gas getting into the magnet. So you want a slow and steady liquid flow to start. Then once you have accumulated some liquid you can increase the flow.

13:53:33 From Gerd Gemmecker : if you fill a magnet with a very low He Level, and you start by blowing in He gas with high pressure, there's a Chance that you might "disturb" the already low He Level and cause a quench. "Careful" fillign would mean avoid to blow in a lot of He gas (before the liquid Comes), and avoid to high filling pressure

13:53:35 From Bert Heise : @Josh Kurutz: Make \*sure\* liquid helium comes out of the transfer line. \*Don't\* go into the magnet with the transfer line with „full helium flame blazing“ (too much pressure!) - release pressure from the helium dewar before inserting the transfer line!

13:54:21 From Josh Kurutz : Thanks, @Bob, @Gerd, @Bert!

13:54:57 From David Gardner : When filling an extremely low magnet, make sure you are filling very slowly and be careful not to let warm helium gas into the cryostat, the gas might come in contact with the joints and cause them to become isothermic and trigger a quench.

13:55:02 From Bert Heise : @Mark Swanson: Not really... now do you refer to the first-generation Magnex shielded magnets Bruker provided?

13:56:09 From David Gardner : If you discharge the 500 Magnex with a power supply, you should be able to recover it.

13:56:34 From Bert Heise : Drop-off plates have nothing to do with a quench per se - it's to prevent overpressure in the \*vacuum chamber\* (from gases collected during long time of operation).

13:57:10 From Gerd Gemmecker : "low He Level filling" this doesn't apply to pumped magnets! They have separate He reservoirs,

13:58:02 From Martha Morton : Thanks for the meeting!

13:58:20 From Gerd Gemmecker : oops ..."low He Level filling" this doesn't apply to pumped magnets! They have separate He reservoirs, so filling in "vigorously" would not interfere with the coil part.

14:00:53 From David Wassmann : Thank you. I need to run. Would you please email us with a link to this recording if that is possible? Great information shared and discussion.

14:01:10 From Christopher LeClair : Quenches come in different levels. A "soft" quench has a good chance of retaining the vacuum. While a more violent quench will not.

14:01:53 From Kristopher Kolonko : thank you! very interesting and informative!

14:03:02 From Raymond Bret Clark : How do you avoid suppliers that are trying to price gouge?

14:03:11 From Darcy Burns : when siting recovery units when space is an issue;  
--> are ground vibrations from the compressors an issue wrt artifacts and noise in the NMR spectra?  
--> Is there a minimum distance to site the compressors wrt magnets (not including stray field ; ) ).

14:03:12 From Bob Berno : Excellent discussion. I have to move on to the next thing. Best wishes everyone.

14:05:43 From Darcy Burns : thanks Razvan - much appreciated : )

14:07:19 From Hari Krishna Santhapuram : what is the cost for He recovery system for small organizations with only one NMR instrument?

14:08:39 From Bert Heise : @Christopher LeClair: Actually „slow quenches“ (= main coil switch opens because it gets too warm) are known to happen more often with helium recycling systems when overpressure valves are set up too high in pressure or are too far away... Essentially the helium warms up (pressure cooker!) making the supercon wire in the switch non-superconducting. Place overpressure valves near to the magnets!!

14:08:45 From Raymond Bret Clark : Thank you everyone for this helpful information.

14:08:52 From Roberto Gil : Great Meeting! Thanks! I have to go. Cheers!

14:09:07 From Robert Stueber : Is the Producer Price Index the best benchmark for price increases?

14:09:38 From Josh Kurutz : @Razvan, what's the material composing that 50m Heliosmart recovery line?

14:10:08 From Hari Krishna Santhapuram : what is the cost for He recovery system for small organizations with only one NMR instrument?

14:10:37 From Craig Bettenhausen : @Hari I think the smallest systems including liquification run about \$100K, and that's designed for 2-5 magnets. Capture and compression only I was hearing here earlier can be down to a \$25K. But that's based mostly on Quantum Design's #, I don't have recent numbers from the other folks.

14:10:50 From Erica Brendler : Where was this Heliosmart Test Station on the foto? France or Germany?

14:11:07 From Michal Respondek : Switzerland

14:11:48 From MR Resources Inc : videos ae uploaded to YOUTUBE and also available on the IVN NMR Users Group website at <https://www.ivanmr.com>

14:12:36 From Dan Iverson to MR Resources Inc(Direct Message) : Eric, will the chat messages also be available

14:12:48 From Bert Heise : Typically recycling systems are copper-tubed

14:13:16 From MR Resources Inc to Dan Iverson(Direct Message) : yes

14:13:46 From MR Resources Inc : MR Resources YouTube Channel  
<https://www.youtube.com/channel/UCTvTGmgoPnQsoG6ZVLibkyg>

14:14:03 From Dan Iverson to MR Resources Inc(Direct Message) : You might want to let everyone know

14:14:32 From Bagher Mahdavi : in case of failiure in recovery of MRI they will consume 30 L/ day

14:15:18 From MR Resources Inc : Also the Entire CHAT will be available on the IVAN Website  
<https://www.ivanmr.com>

14:16:06 From Robert Stueber : @Phil Thank you, interesting would an index to the suppliers third parties be solely provided by the suppliers than, in trust? I haven't seen third party indexes posted publicly before

14:18:00 From James Aramini : Great meeting and presentations. Thank you all!

14:18:01 From Dmitry Pichugin : Thanks a lot everyone!

14:18:10 From Robert Stueber : Thank you all!

14:18:16 From Ping YU : Thank you very much!

14:18:20 From Michal Respondek : Thank you all

14:18:21 From Christine Davenport : Thank you1

14:18:25 From Tara Sprules : Thanks to all the presenters. Extremely interesting, and Nancy, cannot quite imagine how difficult your situation has been. Best of luck.

14:18:25 From Peter Thompson : Thanks, all

14:18:28 From Catherine Deborde : Thank you very Much. It was so informative.

14:18:29 From Bagher Mahdavi : thanks a lot

14:18:30 From Andreas Seifert : Great Meeting! Thank you.

14:18:37 From Erica Brendler : Thanks a lot!

14:18:57 From Ekaterina B : Thank you! As a last year PhD in NMR I hope the technique has the future.