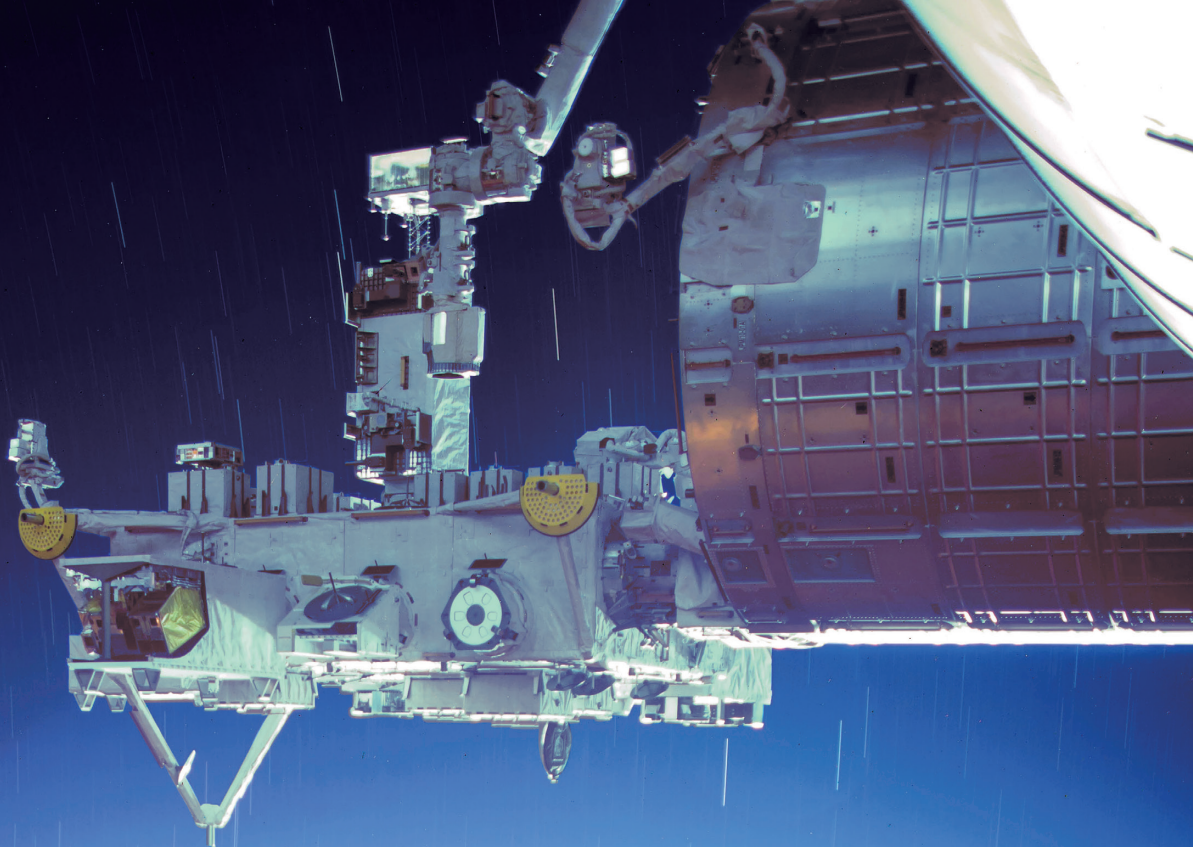




広がる「きぼう」利用の未来



国際宇宙ステーション

「きぼう」利用シンポジウム

国際宇宙ステーション

「きぼう」利用シンポジウム

2019年2月12日(火)・13日(水)

会場 Link-J 日本橋ライフサイエンスハブ
室町ちばぎん三井ビルディング 8階 (COREDO室町3)
〒103-0022 東京都中央区日本橋室町1-5-5
主催 国立研究開発法人 宇宙航空研究開発機構 (JAXA)
協賛 Space BD 株式会社

Program

プログラム

第1部 「きぼう」利用から始まる価値の創造

挨拶 | 13:00-13:05

オープニング 白須賀 貴樹 文部科学大臣政務官

基調講演 | 13:05-13:20

有人宇宙活動の現状と将来展望



若田 光一 JAXA / 理事

ステータスレポート | 13:20-13:40

「きぼう」利用の現状について



小川 志保 JAXA / きぼう利用センター長

パネルディスカッション | 13:40-15:00

健康に暮らす社会に向けた宇宙の活用—基礎研究や民間の取組み

ISS・きぼう実験棟は、微小重力環境であるため、加齢現象でみられる骨量減少と筋委縮が、地上の約10～30倍の早さで発生する。我が国において、高齢化・高ストレス社会の課題克服は社会問題となっている。ISS・きぼう実験棟における環境が健康長寿社会へどのような価値を与えたのか、パネラーの见解を示し、今後の在り方についても議論していく。

モデレーター



坂田 亮太郎 日経バイオテック / 副編集長

パネラー



永井 良三 自治医科大学 / 学長



山本 雅之
東北大学東北メディカル・メガバンク機構 / 機構長



瀬原 淳子 京都大学 / 教授



細井 純一 株式会社資生堂 / 研究員

休憩 | 15:00-15:30

パネルディスカッション | 15:30-16:50

宇宙を新薬設計に役立てる—基礎研究から民間利用への拡がり

試料の性状確認・改善や結晶化条件の最適化、その後の宇宙実験を通して地上実験より高品質なタンパク質結晶を生成でき、新薬設計に役立つ構造情報を提供できる。ISS・きぼう実験棟における環境が、創薬実験にどのような価値を与えたのか、パネラーの见解を示し、今後の在り方について議論していく。

モデレーター



西島 和三 持田製薬株式会社 / フェロー

パネラー



舩屋 圭一 ペプチドリーム株式会社 / 取締役副社長



阪本 泰光 岩手医科大学 / 准教授



善光 龍哉 日本医療研究開発機構 (AMED) / 調査役



細田 雅人 インタープロテイン株式会社 / 社長

休憩 | 16:50-17:00

パネルディスカッション | 17:00-18:20

活動領域を広げる実践場としての宇宙空間—民間利用の成果と事業化への取組み

地球低軌道における民間活動が高まる中、民間による ISS を利用・活用した活動が今後更に増加することが期待される。

ISS・きぼうでは、超小型衛星の放出や曝露環境での材料実験等、「きぼう」ならではのユニークな

機能による船外利用機会を提供することができる。ISS・きぼう実験棟における環境（船外）が、

民間の事業にどのような価値を与えたのか、パネラーの見解を示し、今後の事業化への取組みについて議論していく。

モデレーター



中道 理 日経 BP 総研クリーンテックラボ / 上級研究員、リアル開発会議 / 編集長

パネラー



岩本 匡平
株式会社ソニーコンピュータサイエンス研究所



大山 洋平
三井物産株式会社 航空・交通事業部 航空事業室 / 室長



瀧田 安浩 株式会社大林組 / 主任研究員



島村 秀樹 株式会社パスコ / 社長

ラップアップ | 18:20-18:30

ISS 利用の今後の展望



上森 規光 JAXA / 有人宇宙技術部門事業推進部長

第2部 国際宇宙ステーションが創る市場

2/13 (水)
10:00-12:00

基調講演 | 10:00-10:30

ISS が拓く地球低軌道（LEO）の経済—LEO 市場の創出と拡大



Mr. Jeffrey Manber NanoRacks/CEO

対 談 | 10:30-11:30

LEO の技術革新が社会にもたらす価値

地上では、デジタルテクノロジーの発展により、様々なコトが自動化され、社会変革が実現しつつある。

これらの地上技術を LEO で利用することで、更なる技術革新が期待できる。

LEO の技術革新が社会にもたらす価値について、双方の見解を示し、ファシリテーターも交えて議論していく。

ファシリテーター



登坂 淳一 フリーアナウンサー

対 談



茂木 健一郎 脳科学者



山崎 直子 元 JAXA 宇宙飛行士



岸 博幸 慶應義塾大学大学院 / 教授

昼休憩 | 11:30-13:00

第3部 JAXA / NASA Joint Workshop

13:00-15:40

対 談 | 13:00-13:50

ISS 利用の今後の展望

ファシリテーター



上森 規光 JAXA / 有人宇宙技術部門事業推進部長

対 談



若田 光一 JAXA / 理事



Mr. Sam Scimemi NASA/ISS Director

成果報告 | 13:50-14:50

JP-US OP3* の取組みと今後の期待

日米間での船内・船外の実験設備・機器や実験結果の相互活用、及び共同研究等を実施する意義について、JAXA/NASA 双方の見解を示し、今後の期待について共有する。

※ISSの成果最大化に向けた日米協力強化の枠組み

司 会



白川 正輝 JAXA / きぼう利用センター企画グループ長

発表者

マウスミッション



芝 大
JAXA/きぼう利用センター主幹



Dr. Frances Donovan
NASA/ARC(Space Biology)



ロボティクス
土井 忍
JAXA/有人宇宙技術センター主幹



Mr. Andres Martinez
NASA/HQ(Advanced Exploration Systems)



材料実験
小原 真司
NIMS/ELF PI



Dr. Doug Matson
ELF PI

休憩 | 14:50-15:00

基調講演 | 15:00–15:20

米国における商業利用の現状



Mr. Sam Scimemi NASA/ISS Director

基調講演 | 15:20–15:40

米国におけるISS利用の現状と今後の展望



Ms. Marybeth Edeen NASA/OZ Manager

休憩 | 15:40–16:10

第4部 地球低軌道活動の発展に向けた今後の期待と展望

16:10–18:00

パネルディスカッション | 16:10–17:40

2025年以降の地球低軌道活動への期待—民間の視点から

現状、ISSの運用は2024年までしか計画されておらず、2025年以降については未定である。一方で、米国政府は、深宇宙へ向かうための宇宙基地となる Deep Space Gateway を2026年に完成させる計画を発表した。このような状況下で、2025年以降の地球低軌道活動への期待と意義について、民間企業からの見解を示し、今後の在り方について議論していく。

モデレーター



横山 哲朗 有人宇宙システム株式会社 (JAMSS) /元JAXA ISS プログラムマネージャー

パネラー



Mr. Andrew Rush Made In Space, Inc./CEO



Mr. John Vellinger Techshot, Inc./CEO



Mr. Mike Lewis NanoRacks/Chief Innovation Officer



Mr. Twyman Clemens
Space Tango, Inc./President and CEO



Dr. Per Christian Steimle
Airbus/Bartolomeo Program Manager



永崎 将利 Space BD 株式会社 /CEO

話題提供 | 17:40–17:55

ビジネスを目指した官民連携の状況について



岩本 裕之 JAXA/ 新事業促進部長

閉会挨拶 | 17:55–18:00



若田 光一 JAXA/ 理事

Introduction of the speaker

登壇者の紹介



白須賀 貴樹
文部科学大臣政務官

1975年千葉県生まれ、東京歯科大学歯学部卒業。歯科医師、学校法人理事長（幼稚園）等を経て、2012年衆議院総選挙に初当選。現在3期目。2018年10月より現職（内閣府大臣政務官及び復興大臣政務官を兼務）。

国際宇宙ステーション（ISS）計画は、日本・米国等の15ヶ国が参加する平和目的の国際協力プロジェクトです。我が国は、「きぼう」及び「こうのとりの開発・運用や日本人宇宙飛行士の長期滞在によりISS計画に参加しており、これまでに、有人・無人宇宙技術の獲得、国際プレゼンスの確立、宇宙産業の振興、青少年育成等の多様な成果を上げてきています。また、「きぼう」利用については、大学等の学術研究に留まらず、民間企業による有償利用や宇宙新興国による利用も着実に増えるなど、当初想定もされなかった形で大きく発展していると考えています。このシンポジウムが「きぼう」利用のさらなる拡充に繋がることを期待しております。



小川 志保
JAXA/ きぼう利用センター長

宇宙開発事業団に1987年入社。1995年（平成7年）から宇宙環境利用の推進・企画業務に従事。公募型の地上研究募集や、きぼう利用テーマの募集選定、利用戦略の策定などを担当。2018年4月より、きぼう利用センター長を拝命。

きぼう利用の企画・推進業務に長年かわり「生き字引」と言われています。宇宙を取り巻く状況はこの近年大きく変化し、さまざまな企業や人が「ことづくり」の場として参画ははじめ、今まで思ってもみなかった、ISSや「きぼう」の利用が拡がってきました。そのため、「以前はこうでした」「この実施は難しいかも」という言葉は封印して、常に前進姿勢で取り組んでまいります。JAXAは宇宙環境利用のエンジニアやプログラムサイエンティストがいます。どうぞ、みなさんが宇宙環境を使ってしたいことを相談ください。お待ちしております。



若田 光一
JAXA/ 理事

1996年、2000年、2009年にMSとして搭乗し、2009年には日本人として初めてISS長期滞在ミッションを実施した。2014年、日本人初のISS船長（コマンダー）に就任。合計4回の総宇宙滞在時間は日本人最長。2018年4月より現職。

宇宙開発を推進する新たな国々の台頭や民間企業による地球低軌道の商業利用の活発化など、我が国の有人宇宙活動は大きな転機に差し掛かっています。その中で、国際競争力を有する日本ならではの有人宇宙技術を開発し、「きぼう」を研究開発基盤として定着させるべく、より使いやすい利用サービスの提供や民間等との連携拡大、さらには将来を見据えた運用の効率化を着実に加速させていく必要があります。JAXA 有人宇宙技術部門では、「きぼう」の運用・利用とHTV運用の着実な実施、JP-US OP3の推進、民間事業者の参画、国際宇宙探査に向けた技術実証を進め、ISSの成果最大化を図ると共に、「きぼう」を活用してさまざまな事業や利用が実現されるよう、成果が社会に根付く活動とチャレンジングな研究開発を積極的に進めてまいります。



坂田 亮太郎
日経バイオテック /副編集長

1996年東京工業大学生命理工学部卒業、98年同大学大学院修了。98年日経BP入社、日経バイオテック配属。2004年から日経ビジネス記者。北京支局長・上海支局長などを経て2018年4月より現職

「きぼう」によって、我々日本人にとっても、宇宙の産業利用は遠い未来の話ではなく、今日のテーマとなりました。このシンポジウムを通じて、具体的な議論を深めたいです。

地上で困難な結晶生成の条件検討および宇宙における結晶生成とその構造解析精度向上の実証を図って来ました。特に低分子やニューモダリティーの創薬においてX線結晶構造解析は重要であり、地上で困難なケースが多い事も周知されており、きぼう利用の価値は、今後、大きく期待されていると思われます。



中道 理

日経 BP 総研クリーンテックラボ / 上級研究員、リアル開発会議 / 編集長

日経 BP 社 日経 BP 総研 上席研究員 兼 リアル開発会議編集長。1997年日経 BP 社入社。『日経バイト』『日経コミュニケーション』『日経エレクトロニクス』記者、副編集長を経て現職。

—
宇宙に関連したビジネスが今後伸びていくことに疑問の余地はありませんが、多くの企業にとって何をとっかかりにして、どのようなビジネスに参入すればよいのか、わからないのが現状です。来場された皆様と一緒に、宇宙ビジネスへの参入の方法と一緒に考えたいと思っています。



岩本 匡平

株式会社ソニーコンピュータサイエンス研究所

ソニー CSLにおける衛星光通信の研究リーダー。専門は応用光学。2016年よりJAXA主幹研究開発員を兼任。パロアルト研究所客員研究員、ソニー（株）Distinguished Resarcherを歴任。

—
米国在住時に多くの宇宙ベンチャーを目の当たりにし、宇宙がこれほどまでに身近なものになったことに衝撃を受けました。日本でも研究を開始するときに米国との環境差に不安はありましたが、きぼう利用による研究開発が可能であることは、米国のスピードに勝るとも劣らない環境であり、私にとっての2回目の衝撃でした。きぼう利用が衝撃的ではなく当たり前の環境となり、数多くのチャレンジができる社会になってほしいです。



湊田 安浩

株式会社大林組 / 主任研究員

1967年生。1993年名古屋大学大学院工学研究科建築学専攻修了・コンクリート工学、同年株式会社大林組入社。建設用コンクリート材料研究、現在、技術研究所にて、宇宙実験・各種材料開発に従事。

—
大林組は、東京スカイツリー®の建設を契機として究極の高い建造物を目指して、「宇宙エレベーター建設構想」を発表しました。このうち、ケーブルの素材を想定し、日本実験棟「きぼう」の船外曝露装置で、宇宙空間での耐性を調べる実験を行いました。このような宇宙実験を契機に、建設業も宇宙利用に踏み出していく道を探っています。

取得）においては、X線構造解析は必須と言っても過言ではありません。しかし一方で、それらのタンパク質そのものの結晶化も化合物との共結晶化も極めて難易度が高いのも現実です。きぼう実験棟での微小重力環境下での結晶化は、これらの問題点の解決に大きく貢献してくれると考え、実際に、いくつもの事例で、これまで地上の実験ではほぼ不可能と思われていた結晶化に成功しています。



阪本 泰光

岩手医科大学 / 准教授

博士(薬学) 2002年、長岡技術科学大学大学院単位取得退学。同年、昭和大学保健医療学部助手、2007年講師。2008年より岩手医科大学薬学部助手、2009年助教、2017年より現職。専門は構造生物学—

人類は1940年代のペニシリンの実用化により、1950年代には数十歳も寿命を延ばすことができました。しかしながら、抗菌薬の濫用や新しい抗菌薬開発の停滞によって、極めて近い将来に抗菌薬のない時代が到来すると言われています。私達は2011年に始めた宇宙実験による成果から、菌周病菌や多剤耐性菌の増殖を抑える化合物を見出し、新しい作用機序による抗菌薬の開発を目指しています。2011年に始めた宇宙実験は、震災で被災した私達にとって、当に「きぼう」の光でした。国際宇宙ステーションと日本実験棟「きぼう」が今後も人類の希望と未来を支えるプラットフォームとして活躍してくれることを心より願っています。



善光 龍哉

日本医療研究開発機構（AMED）/ 調査役

北海道大学大学院薬学研究科修士課程終了。アステラス製薬株式会社に入社し、20年以上に渡ってMedicinal Chemistryに従事。2015年からAMEDにてアカデミア創薬を推進している。

—
これまでに、微小重力下におけるタンパク質結晶化実験で、数々の成果をあげていますが、今後のさらなる成果に期待しています。特に、中分子の構造解析に使用するための大型結晶の作製や多種類の分子からなる生体複合体の結晶化を可能にする技術開発を進めてほしいです。また、高齢化社会を迎える中、老化研究にも大きな期待を寄せています。



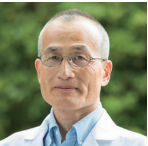
細田 雅人

インタープロテイン株式会社 / 社長

弘前大学現農学生命科学部分子生命科学科卒、シェリングプラウ（株）を経て、キリンビール（株）医薬事業本部（現協和発酵キリン）、その後、2015年にインタープロテイン（株）に入り、翌年より現職—

2011年からJAXAと共に微小重力環境下での結晶生成に取り組み、

によって、地上の生命がいかに頑強で可塑性があるかを知ることができました。私にとって、このようなことを発見できたことが、宇宙科学への関わりによる収穫だったと思います。



細井 純一

株式会社資生堂 / 研究員

東京大学医科学研究所で博士号を取得後、米国NIH、Harvard大学への留学を経て、資生堂に入社。心理学的・生理学的・生化学的手法を用いて、主に皮膚の免疫機構の研究に従事。

—
JAXAの地上閉鎖環境試験施設を利用してストレスに関する共同研究を行い、生理的な変化、皮膚の変化に関する知見を学術雑誌に発表してきました。JAXAと共同での基礎研究は、地上での一般市民の生活にも利益をもたらします。今後は、実際に低軌道滞在、月面滞在の機会を利用して、健康な皮膚を維持するためのソリューションを開発していきたいです。



西島 和三

持田製薬株式会社 / フェロー

持田製薬株式会社 フェロー、日本学術振興会 監事、東北大学 客員教授、横浜国立大学 客員教授、高エネルギー加速器研究機構 経営協議会機構外委員、宇宙航空研究開発機構 きぼう利用推進有識者委員—
薬の標的となるタンパク質の構造解析を目的として、蛋白質構造解析コンソーシアム(製薬企業22社加盟)は放射光SPring-8に専用ビームライン（2002年～2011年）を保有しました。私は、コンソーシアムの幹事長（2001年～2006年）として、この世界最高レベルの放射光を十分に活用するために、宇宙空間における高品質なタンパク質結晶生成を推進しました。JAXAとコンソーシアムの協力活動に関する協定締結（2002年）以降、製薬会社による宇宙空間の利用が促進されました。今後、様々なライフサイエンス分野での産学官による「きぼう」有効利用とその成果、波及効果に期待します。



舩屋 圭一

ペプチドリーム株式会社 / 取締役副社長

1998年に東京工業大学で博士を取得後、三菱化学医薬部門、ノバルティスファーマの日本法人を経て、バーゼル本社で抗癌剤の研究開発に従事。2014年にペプチドリーム社に合流し、2018年より取締役副社長。

—
創薬研究における、化合物とタンパク質の共結晶化及びX線構造解析の重要性は以前にも増して高まってます。特に難易度が高いとされているタンパク—タンパク相互作用や膜タンパク質に対する創薬（出発化合物の同定やさらなる最適化による臨床開発候補化合物の



永井 良三

自治医科大学 / 学長

1974 東京大学医学部卒、1975 東大病院、1983 パーモント大学、1995 群馬大学第二内科教授、1999 東京大学循環器内科教授、2003 東大病院長、2012 自治医科大学学長—

国際宇宙ステーション（ISS）の「きぼう」日本実験棟は、医学研究の新しい拠点です。その代表がタンパク質の結晶化と創薬です。「きぼう」の微小重力下では溶液内の対流がほとんどなく、きれいな結晶を容易に作ることができます。また、宇宙では骨や筋肉だけでなく、全身臓器の老化も加速されます。「きぼう」では小動物の飼育も可能で、遠心力により自在に重力を発生させることもできます。このように「きぼう」の実験設備は着実に改良されており、今後新しい成果が得られることが期待されます。

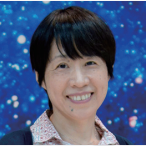


山本 雅之

東北大学東北メディカル・メガバンク機構 / 機構長

東北大学医学部卒業。同大学院修了（医学博士）。筑波大学教授等を経て2007年より東北大学医学系研究科教授。2008年–2012年、同研究科長。2012年より東北大学東北メディカル・メガバンク機構長。

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私たちは国際宇宙ステーション日本実験棟「きぼう」において、遺伝子ノックアウトマウスを含む12匹のマウスの長期飼育（34日間）と全数帰還に成功しました。これは世界初の成果となります。この成功を受けて、今後、ヒト病態解析の目的で、世界中で作製されている多くの遺伝子欠失マウス系統についても、宇宙ストレスの影響下で個々の遺伝子欠失の影響がどのように顕在化するのかを解析できる道が開かれました。まさに宇宙マウス実験の時代（Decade of Space Mouse）です。例えば、骨減少や筋減弱が加速される宇宙環境を活用し、地上における健康寿命の増進に関わる研究の促進などが期待されます。



瀬原 淳子

京都大学 / 教授

骨格筋再生に関する研究を行ってきた瀬原は、今、ゼブラフィッシュを用いて宇宙滞在による骨格筋萎縮や、老人で見られる筋萎縮のメカニズムを解明しようとしています。初めて得られた、宇宙滞在初期から地上に帰った後の回復期までの骨格筋トランスクリプトームデータは、私たちに、宇宙における骨格筋萎縮の新たな機構や地上での骨格筋維持・ホメオスタシスにおける重力の役割を教えてくれるでしょう。

—
私たちは、ゼブラフィッシュを宇宙ステーションに打ち上げ、六週間の滞在に成功しました。彼らは、驚くほど早く学習し、無重力の中で泳げるようになりました。さらにトランスクリプトーム解析をすること



大山 洋平

三井物産株式会社 航空・交通事業部 航空事業室 / 室長

三井物産モビリティ第二本部にて航空・宇宙・防衛領域を担当。三井物産は米 Space Flight Industries を初め、衛星製造、衛星データ処理分野で取組みあり。

—

三井物産はきぼう実験棟を通じた超小型衛星放出に加え、米 Space Flight Industries を通じた 50kg~500kg の衛星放出を通じ、実証実験からコマーシャルスケールまで多種多様な衛星打上げニーズに対応しています。



島村 秀樹

株式会社パスコ / 社長

千葉大学工学部写真工学科卒業、同大学院工学研究科修士・自然科学研究科博士課程修了。1981 年パスコ入社後、取締役・常務取締役を経て 2018 年 6 月より現職。博士（工学）。（一社）日本リモートセンシング学会副会長。

—

計測や測量技術、AI を実装したデータ解析技術の進化には、未来社会を創造するための最先端技術として大きな期待が寄せられています。特に、宇宙空間から地球上を観測する技術の進化は目覚ましく、境界にとらわれない広域の定時・定期観測が可能な衛星活用の可能性は無限に広がっています。

パスコは、人工衛星・航空機・ドローン・車両・船などのあらゆる視点からリモートセンシング技術を駆使し、社会の課題解決に向けたサービスを創り出しています。そして、20 基を超える取り扱い衛星と北海道・沖縄に所有する地上局、2005 年から本格化した衛星活用事業で積み上げてきた実績とノウハウをもとに、新たな宇宙利用の分野に挑戦します。



上森 規光

JAXA / 有人宇宙技術部門事業推進部長

有人部門の事業推進部長です。計画、予算、広報、法務など部門の全般管理を担当しています。

前職は有保室長として、部門のほとんどのハードウェア・手順の安全審査を実施しました。

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今 ISS ／きぼうから得られている実験成果は、現在の地上の人々にも役立つのみならず、将来人類が宇宙へ進出するときに必要な様々な知識でもあります。今 NASA や日本が参加して Gateway の開発に進もうとしていますが、ISS/Kibo の価値は不変です。より遠くの月軌道・月面を目指す活動と、近い場所である低軌道をもっと身近にする活動を両立させるのが、人類の未来の姿であると信じています。



Mr. Jeffrey Manber

NanoRacks / CEO

Jeffrey has served as the CEO of NanoRacks since 2009, growing the company into the first commercial space station company with customers. He brings to the company unique experience in making space just another place to do business. Before NanoRacks, Jeffrey helped establish the Office of Space Commerce with the Reagan Administration’s Department of Commerce, serving as a voice for private industry in space. Afterwards he became the only American to officially work for the Russian space program, serving as Managing Director of Energia USA. Under Jeffrey’s leadership, NanoRacks was a pioneer, and now the leader, in the commercial market for low-Earth orbit utilization. For the future, Jeffrey is increasingly focused on populating the solar system with commercial space station platforms, owned and operated by NanoRacks.

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Started as a self-financed private company in a storage facility space in 2009, NanoRacks has disrupted the market for low-earth orbit services. We developed the first US commercial CubeSat deployment program as well as the first commercial successful biomedical program. We have proved that there is a commercial LEO market and have pioneered US/ international commercial participation on the Space Station. Additionally we have developed Unique Operational Expertise in Commercial Relations with NASA, JAXA, and other ISS space agencies. NanoRacks has deployed over 230 satellites from the ISS and has flown over 700 customer payloads on over 35 missions to the ISS. We have installed and commissioned new research and scientific equipment that have resulted in the creation of new business lines. We are currently constructing the Bishop Science Airlock. We look forward to expanding commercial operations through the operational lifetime of the ISS as well as on other platforms in Low Earth Orbit and beyond.



登坂 淳一

フリーアナウンサー

1971 年 6 月 10 日東京生まれ。1997 年 NHK 入局。2003 年東京アナウンスへ異動。「おはよう日本」「正午ニュース」、国会中継も担当し郵政解散など小泉政権を伝えた。2011 年東日本大震災の際には、約 1 ヶ月間にわたりスタジオキャスターをつとめた。2018 年 1 月 NHK 退社。

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遠くのこと、関係のないこと。宇宙に対してそんなイメージを持つ人、いらっしゃるのではないのでしょうか。私もそんな 1 人でした。私は放送の仕事をしてきましたが、宇宙との繋がりと言えば「衛星に電波を飛ばして中継する」。この程度でした…。いま、宇宙をめぐる状況は大きく変わり、宇宙ビジネスは世界の潮流で 30 以上の国が投資をしている。中でも地球低軌道市場は注目が高いと言う。一体、何が出来るのか？

2019 年、宇宙への好奇心、始めてみませんか？



茂木 健一郎

脳科学者

1962 年 10 月 20 日東京生まれ。東京大学理学部、法学部卒業後、東京大学大学院理学系研究科物理学専攻課程修了。理学博士。理化学研究所、ケンブリッジ大学を経て、ソニーコンピューターサイエンス研究所・シニアリサーチャー。「クオリア」（感覚の持つ質感）をキーワードとして脳と心の間を研究するとともに、文藝評論、美術評論などにも取り組みながら、作家、ブロードキャスターとしても活躍の幅を広げている。2012 年には TED カンファレンスで日本人初のスピーカーとして登壇。著書の国内出版は 200 冊を超え、2018 年に初の英文による書籍『IKIGAI』を出版。世界各国で順次出版中。その活動を世界に広げている。

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宇宙開発は、本格的に民間主導で行われる時代を迎えており、そこにイノベーション論という「ブルーオーシャン」があります。無重力の空間でそこでの実験や検証、開発は、今後の文化、経済の発展に欠かせません。一方、宇宙に目を向けることは、人類の脳が次の段階に進化する上で必須です。宇宙に出て地球を見ることは最も劇的な「メタ認知」（外から自分を見ること）の実践であり、人類の意識段階を大いに進めることになると思います。地上では、人工知能が「シンギュラリティ」を迎えるという議論が盛んですが、人類の意識もまた、宇宙に出るという点において「宇宙的シンギュラリティ」を迎えるべき時期に来ていると言えるだろう。



岸 博幸

慶應義塾大学大学院 / 教授

1986 年 3 月、一橋大学経済学部卒業。同年 4 月、通商産業省入省。総務大臣秘書官、慶應義塾大学 DMC 統合研究機構助教授などを経て、2008 年 4 月、慶應義塾大学大学院メディアデザイン研究科教授に就任。



山崎 直子

元 JAXA 宇宙飛行士

宇宙飛行士。2010 年スペースシャトル・ディスカバリー号搭乗、ISS 組立補給ミッション STS-131 に従事。JAXA 退職後、内閣府宇宙政策委員会委員、一般社団法人スペースポートジャパン代表理事など。

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宇宙飛行士になる前は JAXA で「きぼう」開発に携わり、2010 年に ISS に滞在した際には、「きぼう」で使用する実験装置や試料を取り付けたり、地上に持ち帰ったりしました。現在は、宇宙政策委員会委員としても、「きぼう」が将来の技術実証に繋がること、社会に貢献すること、多くのユーザーが参画できる場となることを期待しています。



白川 正輝

JAXA / きぼう利用センター企画グループ長

1994 年 4 月、宇宙開発事業団（現 JAXA）入社。2004~2006 年、内閣府（科学技術政策担当）勤務。2018 年 4 月より、JAXA きぼう利用センターきぼう利用企画グループ長及び国際調整担当。博士（工学）

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入社以来、宇宙環境利用及び ISS 計画に関する業務に従事し、最近では「きぼう」での小動物利用研究や国際調整を推進してきました。現在はきぼう利用戦略の策定等を担当しています。「きぼう」が科学研究や技術開発の分野で優れた成果を蓄積し、地上社会や将来の日本の有人技術に不可欠な軌道上の研究開発プラットフォームとして幅広く認識されるよう、戦略的な取組みを推進したいと思います。



芝 大

JAXA / きぼう利用センター主幹

医学部教員として約 10 年間、人体解剖や組織学の医学教育のほか、腎疾患にかかる基礎研究を行って来ました。2013 年 JAXA 入社。宇宙マウス飼育ミッションを立ち上げからプロジェクトサイエンティストとして担当。博士（理学）

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「あこがれ」だけではなく、宇宙をより近くに「実感」してもらいたい。2030 年には 75 歳以上人口は現在より 500 万人以上増え 2200 万人を超えることが想定されています。現役世代の支えを可能な限り受けないよう「死ぬまで健康に生活できる」ことがより求められる時代になっていると思います。最先端の科学技術を用い「より高みへ、より遠くへ」行くだけでなく、「宇宙利用」をより生活・人生に密着した形で国民に還元するサイエンスを生み出すことを意識し、宇宙を実感してもらえるようにしたいです。



Dr. Frances Donovan

NASA / ARC （Space Biology）

I am the Project Scientist for NASA Space Biology, Ames Research Center, with a doctorate in biological sciences.

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I lead the Space Biology ISS flight science processes, working with researchers, ISS Research Integration Office, and our implementation partners. Also, I serve as the liaison to JAXA for Space Biology. NASA Space Biology conducts ISS research to advance human space exploration and scientific knowledge using a diversity of non-human model organisms.



土井 忍

JAXA/ 有人宇宙技術センター主幹

1994年に入社。 1996年より「きぼう」ロボットアーム開発を担当。現在は、エアロックを含む船外システムのインテグレーション及び、将来の有人宇宙活動に必要なとなるロボット技術の研究開発を担当。

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「きぼう」小型衛星放出の放出能力の拡大や、中型曝露実験アダプタの小型実験装置の対応化など、よりユーザ目線に立って、使いやすい技術実証プラットフォームの機能拡充を進めていきたいと思います。また、民生のロボット技術を適用し、将来の有人宇宙活動を効率的かつ安全に進めるための取り組みを推進するため、「きぼう」をロボット技術の実証プラットフォームとしての活用する取り組みも進めていきたいと考えています。



Mr. Andres Martinez

NASA/HQ(Advanced Exploration Systems)

Program Executive in the Advanced Exploration Systems (AES) division of the HEOMD at NASA HQ.

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At AES, he leads the Small Satellites and he is responsible for several deep space missions, SPHERES and Astrobee (free-flyer robots aboard the International Space Station). Conduct Research and STEM activities using Astrobee. Use Astrobee to assist ISS Crew. Support Japan/U.S. cooperation (JP-US OP3)



小原 真司

NIMS/ELF PI

国立研究開発法人 物質・材料研究機構（NIMS）先端材料解析研究拠点 主幹研究員
統合型材料開発・情報基盤部門（MaDIS）情報統合型物質・材料研究拠点（CMI²）
（公財）高輝度光科学研究センター 利用研究促進部門
JST さきがけ
専門：非晶質構造解析
1998年 東京理科大学大学院理工学研究科工業化学専攻博士課程修了 博士（工学）
1998–2001年（財）高輝度光科学研究センター 協力研究員
2001–2003年（財）高輝度光科学研究センター 研究員
2003–2011年（財）高輝度光科学研究センター 副主幹研究員
2011–2015年（公財）高輝度光科学研究センター 主幹研究員
2015年より現職

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我々は、国際宇宙ステーション ISS の静電浮遊炉（ELF）において、地上では行えない、2000℃を超える高温でのガラス材料の液体状態

の密度・粘性の精密計測を行います。そして、地上の大型実験施設 SPring-8やJ-PARC、米国オークリッジ国立研究所における構造計測、さらにはスーパーコンピュータ「京」等を利用した計算機実験を組み合わせた研究を試みます。ガラスは、高温の液体を急冷することにより合成されますが、「なぜ液体を冷やすとガラスになるか？」の理由の解明に挑戦します。そのための一番重要な情報である液体の密度と粘性を、この唯一無二の ELF を用いて計測します。ここで得られた密度・粘性・構造といった情報はデータ科学に基づいた手法により解析され、得られた知見は、我々 NIMS が目指す新規ガラス材料のハイスループット探索に役立つものとなり、将来の日本の産業界のガラス材料開発を加速させるものになります。



Dr. Doug Matson

ELF PI

Dr. Douglas Matson is an Associate Professor of Mechanical Engineering from Tufts University.

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Professor Matson is the chairman of the ESA Investigator Working Group running electromagnetic levitation experiments on the ISS and serves as the president-elect of the American Society for Gravitational and Space Research.



Mr. Sam Scimemi

NASA/ISS Director

Mr. Scimemi is the Director for International Space Station at NASA Headquarters.

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His duties include implementing policy and programmatic direction and ensuring safe and productive ISS operations and utilization. He engages with the White House and Congress, as well as international space agency leaders around the world regarding human spaceflight issues.



Ms. Marybeth Edeen

NASA/OZ Manager

Marybeth Edeen, Manager, ISS Research Integration Office

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As the ISS Research Integration Office Manager, Ms. Edeen ensures all of the research is integrated and ready to fly to ISS. The ISS averages 300 experiments every 6 months across 6 major subdisciplines and provides benefit for Earth applications and space exploration.



横山 哲朗

有人宇宙システム株式会社（JAMSS）/
元 JAXA ISS プログラムマネージャー

造船会社で技師として経験を積み、JAXA で「きぼう」日本実験棟の開発、運用利用準備に携わり、初期運用時の ISS プログラムマネージャー。現在も経験を生かして、日本の有人宇宙活動の発展と商業化に取り組む

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日本の有人宇宙飛行は、宇宙先進国として、月以遠の有人探査を国際協力で狙える研究開発および利用能力を身に着けるところまで来ています。ISS/ きぼう運用利用で培った経験と知見を生かして、JAXA の国際宇宙探査に、日本の優れた地上技術を応用した有人宇宙探査技術開発の官民協力に繋げたいものです。一方、市場創成段階に入った地球低軌道においては、ISS 後の商業プラットフォームの時代をも見据えて、日本は技術的実証と基礎科学のニーズに加えて、民間ビジネス利用の需要の掘り起こしと、その利用機会提供側を奨励するために、政府と民間レベルでの国際協力を追求することで、LEO 商業化の国際的な潮流に乗るべきです。



Mr. Andrew Rush

Made In Space, Inc./CEO

Andrew Rush is President & CEO of Made In Space Inc. He oversees the operations, business development, and strategy of Made In Space (MIS) as it continues to push boundaries of manufacturing technology in space.

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As the first manufacturing company to operate in space, MIS is uniquely positioned to unlock the tremendous potential of the space economy by creating the tools, infrastructure and equipment necessary for humankind to build among the stars.



Mr. John Vellinger

Techshot, Inc./CEO

My name is John Vellinger. I am president and CEO of Techshot – a company I co-founded in 1988.

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Techshot, develops, owns and operates equipment used inside the ISS by professional researchers. We have equipment for conducting research in space with rodents, plants, flies, cells, bacteria, tissue chips and crystals. Soon Techshot also will have a 3D BioFabrication Facility installed aboard the ISS.



Mr. Mike Lewis

NanoRacks/Chief Innovation Officer

Michael is currently the Chief Innovation Officer at NanoRacks, LLC, where he is responsible for overseeing the technical, scientific, and imaginative direction for the company. He has developed, built, and flown experiment platforms to the ISS, including the NRCSD (the NanoRacks CubeSat Deployer) system which deploys satellites from the ISS, a satellite deployer that deploys satellites off the Northrup Grumman Cygnus spacecraft, as well as a number of unique space platforms that enable space-based science, research, and education.

—
Started as a self-financed private company in a storage facility space in 2009, NanoRacks has disrupted the market for low-earth orbit services. We developed the first US commercial CubeSat deployment program as well as the first commercial successful biomedical program. We have proved that there is a commercial LEO market and have pioneered US/ international commercial participation on the Space Station. Additionally we have developed Unique Operational Expertise in Commercial Relations with NASA, JAXA, and other ISS space agencies. NanoRacks has deployed over 230 satellites from the ISS and has flown over 700 customer payloads on over 35 missions to the ISS. We have installed and commissioned new research and scientific equipment that have resulted in the creation of new business lines. We are currently constructing the Bishop Science Airlock, launching in 2019. We look forward to expanding commercial operations through the operational lifetime of the ISS as well as on other platforms in Low Earth Orbit and beyond.



Mr. Twyman Clemens

Space Tango, Inc./President and CEO

Twyman Clements is the Co-Founder and CEO of Space Tango which builds high value products in microgravity for Earth.

—
Twyman oversees the intersection of business and product design at Space Tango which sees the ISS as a incubator to gather directional knowledge, determine valuable applications as well as understand the unit economics of scalable production. Depending on the launch the company operates two to three facilities on ISS and since February 2017 has flown on 10 missions with 64 Payload and 104 experiments run.



Dr. Per Christian Steimle
Airbus/Bartolomeo Program Manager

Program Manager “Bartolomeo All-in-one Space Mission Service”,
Airbus Defence and Space GmbH, Germany

—
The new Airbus “Bartolomeo” external ISS payload platform is developed for commercial utilization. Becoming available in early 2020, “Bartolomeo” is able to host any payload sizes up to 450 kg in the most versatile and cost-efficient way. Bartolomeo welcomes any commercial and institutional user.



永崎 将利
Space BD株式会社 /CEO

総合商社勤務、教育事業による起業を経て、2017年9月「宇宙商社」Space BD設立、2018年5月JAXAよりISS「きぼう」衛星放出事業の民間事業者に採択

—
当社はJAXA初となる民間開放公募案件により「きぼう」からの超小型衛星放出事業者に選定され、同事業を軸に「きぼう」商業利用を当社戦略の中核と位置付けて地球低軌道商業化に挑んでおります。



岩本 裕之
JAXA/新事業促進部長

1991年NASDA入社。ISSプログラム及び民間利用の推進、ロケットの民間移管、パリ駐在、宇宙教育、宇宙産業強化・宇宙利用拡大、衛星データ利用推進、ワシントン駐在などの業務を経験。2018年7月より現職。

—
NASDA入社直後に担当したのが、きぼう民間利用のための基本方針作りと第1回きぼう利用公募でした。あれから20数余年、宇宙ステーションの民間利用が普通のこととなり、さらに商業化の議論が起きています。また、ISS以外にも小型衛星や民間ロケットなど、多くの宇宙ビジネスが出現し、官主導から民主導の時代と変わりつつあります。そして、これからは宇宙でイノベーションを起こす時代です。JAXAも民間企業と一緒にビジネスを共創する「宇宙イノベーション・パートナーシップ制度（J-SPARC）」を立ち上げました。一緒に世界を変えましょう！

ISS・“Kibo” Utilization Symposium

Program

Part 1 Value creation through the utilization of “Kibo”

DAY 1
13:00 – 18:30

Greeting | 13:00 – 13:05

Opening Remarks Mr. Takaki Shirasuka Parliamentary Vice-Minister of Education, Culture, Sports, Science and Technology

Keynote Speech | 13:05 – 13:20

Current status and future prospects of Human Space Flight Activities



Dr. Koichi Wakata JAXA/Vice President

Status Report | 13:20 – 13:40

Current status of “Kibo” utilization



Ms. Shiho Ogawa JAXA JEM Utilization Center /Director

Panel Discussion | 13:40 – 15:00

Using “Space” for a healthy society—fundamental research and efforts of private sector

Bone and muscle loss, two essential processes of aging, take place about 10 to 30 times faster in the microgravity environment of the ISS “Kibo” Experimental module compared to the ground. Overcoming the issues of aging and stressful living is a major social challenge in Japan. The panelists will discuss the values of the ISS・“Kibo” Experiment module environment for research to promote a healthy, long-living society and forge new paths forward.

Moderator



Mr. Ryotaro Sakata Nikkei Biotechnology & Business /Deputy Editor

Panelist



Prof. Ryoza Nagai
Jichi Medical University/President



Prof. Masayuki Yamamoto
Tohoku University Tohoku Medical Megabank
Organization/Executive Director



Prof. Atsuko Sehara
Kyoto University/Professor



Dr. Junichi Hosoi
Shiseido Company, Limited/Senior Scientist

Break | 15:00 – 15:30

Panel Discussion | 15:30–16:50

Making “Space” useful for designing new drugs—Expanding from fundamental research to private use

By confirming and improving the properties of material samples, optimizing conditions of crystallization, and conducting space experiments, it is possible to grow high quality crystals in the microgravity environment comparing to the ground base experiments. This high quality crystals can provide structural information, which is useful for designing new drugs. The panelists will share their views on the values of research in the ISS / “Kibo” Experiment Module environment for drug design and the paths forward in the field.

<u>Moderator</u>	
	Dr. Kazumi Nishijima MOCHIDA PHARMACEUTICAL CO., LTD./Fellow
<u>Panelist</u>	
	Dr. Keiichi Masuya PeptiDream Inc./Executive Vice President
	Dr. Yasumitsu Sakamoto Iwate Medical University/Associate professor
	Mr. Tatsuya Zenkoh AMED/Manager
	Mr. Masato Hosoda INTERPROTEIN CORPORATION/ CEO & PRESIDENT

Break | 16:50–17:00

Panel Discussion | 17:00–18:20

Space as a practical venue for expanding activities—Outcomes from the private use of space and efforts toward commercialization

The utilization of the ISS is expected to be increased further in the future as the activities by private sector expands in low earth orbit (LEO). Functions unique to ISS / “Kibo” provide opportunities for research applications such as the deployment of micro satellites and material experiments in a low-gravity exposure environment. The panelists will present their views on the values of research in the ISS / “Kibo” Experiment module and discuss about environment for private business and future efforts towards commercialization.

		<h3>Moderator</h3> <hr/>	
Mr. Tadashi Nakamichi		Cleantech Laboratory, Real Kaihatsu Kaigi/Editor-in-Chief	
		<h3>Panelist</h3> <hr/>	
Mr. Kyohei Iwamoto		Sony Computer Science Laboratories, Inc.	
			
Mr. Yasuhiro Fuchita		Mr. Yohei Oyama	
OBAYASHI CORPORATION/ Chief Research Engineer		MITSUI & CO.,LTD./General Manager	
		Dr. Hideki Shimamura	
		PASCO CORPORATION/President & CEO	

Wrap-up | 18:20–18:30

Future prospects of the ISS utilization

	Mr. Norimitsu Kamimori JAXA Human Spaceflight Technology Directorate, Management and Integration Department/Director
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DAY 2
10:00–12:00

Part 2 Market created by the International Space Station

Keynote Speech | 10:00–10:30


Low Earth Orbit (LEO) Economy Created by ISS—Creation and Expansion of the LEO Market

	Mr. Jeffrey Manber NanoRacks/CEO
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Talk | 10:30–11:30

The value that LEO technological innovation brings to society

The advancement of digital technology has engendered the automation of various foundational technologies that are inciting social change on the ground. The use of these ground-based technologies in LEO is expected to drive further technical innovation.Mr. Manber and the facilitator will discuss the values that LEO technological innovation can bring going forward.

Facilitater	
	Mr. Junichi Tosaka Freelance announcer

Talk	
	Dr. Kenichiro Mogi Neuroscientist
	Ms. Naoko Yamazaki Former JAXA Astronaut
	Prof. Hiroyuki Kishi Keio University Graduate School of Media Design/ Professor


Break | 11:30–13:00

Part 3 JAXA / NASA Joint Workshop

13:00–15:40

Talk | 13:00–13:50

Future prospects of ISS utilization


Facilitater	
	Mr. Norimitsu Kamimori JAXA Human Spaceflight Technology Directorate, Management and Integration Department/Director

Talk	
	Dr. Koichi Wakata JAXA /Vice President
	Mr. Sam Scimemi NASA/ISS Director

Efforts of JP-US OP 3 and future expectations

NASA and JAXA will present their views on the benefits of joint research and the sharing and mutual use of laboratory equipment and experimental results between Japan and the United States, along with ideas for future collaborations.

MC

 Dr. Masaki Shirakawa JAXA/Head of JEM Utilization Planning Group


Presenter

Mouse Mission

 Dr. Dai Shiba
JAXA/Manager

 Dr. Frances Donovan
NASA/ARC(Space Biology)

Robotics

 Mr. Shinobu Doi
JAXA/Manager

 Mr. Andres Martinez
NASA/HQ(Advanced Exploration Systems)

Material experiments


 Dr. Shinji Kohara
NIMS/ELF PI

 Dr. Doug Matson
ELF PI

Break | 14:50–15:00

Keynote Speech | 15:50–15:20

Current status and future strategy of commercial utilization of space in the U.S.

 Mr. Sam Scimemi NASA/ISS Director

Keynote Speech | 15:20–15:40

Current status and future prospects of ISS utilization in the U.S.

 Ms. Marybeth Edeen NASA/OZ Manager

Break | 15:40–16:10

Part 4 Expectations and prospects of Activities in Low Earth Orbit


16:10–18:00

Panel Discussion | 16:10–17:40


Expectations of activities in Low Earth Orbit beyond 2025—A Private Perspective


Operation of the ISS is planned out only up to the year 2024. The fate of the ISS from 2025 and beyond remains an open question. Meanwhile, the US government announced plans to complete a “Deep Space Gateway” as a base for deep space exploration in 2026.


Moderator


 Mr. Tetsuro Yokoyama JAMSS/Chief Engineer


Panelist


 Mr. Andrew Rush Made In Space, Inc./CEO

 Mr. John Vellinger Techshot, Inc./CEO

 Mr. Mike Lewis NanoRacks/Chief Innovation Officer


 Mr. Twyman Clemens
Space Tango, Inc./President and CEO

 Dr. Per Christian Steimle
Airbus/Bartolomeo Program Manager


 Mr. Masatoshi Nagasaki
Space BD Inc./Co-Founder & CEO

Topic | 17:40–17:55

Public-private partnership for business

 Mr. Hiroyuki Iwamoto
JAXA Business Development and Industrial Relations Department/Director

Closing remarks | 17:55–18:00

 Dr. Koichi Wakata JAXA/Vice President

Introduction of the speaker



Mr. Takaki Shirasuka
Parliamentary Vice-Minister of Education,
Culture, Sports, Science and Technology

I was born in 1975 in Chiba Prefecture, and graduated from the School of Dentistry of Tokyo Dental College, becoming a licensed dentist. After practicing dentistry and serving as president of a school corporation (kindergarten), I was elected to the House of Representatives in 2012, and I am now serving my third term. I was appointed to my current position in October 2018 serving concurrently as Parliamentary Vice-Minister of the Cabinet Office and Parliamentary Vice-Minister for Reconstruction.

The International Space Station project is an international cooperative endeavor for peaceful purposes participated in by 15 countries, including the United States and Japan. Japan has been involved in the ISS through our development and operation of the Japanese Experiment Module “Kibo” and the H-II Transfer Vehicle “Konotori” and the long-term stays onboard the ISS by Japanese astronauts. Up to now, we have achieved several results, including acquiring manned/unmanned space technology, establishing an international presence in space field, promoting space industry, and fostering young human resources.

The utilization of Kibo has greatly developed beyond the original expectations to expand from only academic research by universities to paid usage of Kibo by private companies and its utilization by space emerging countries.

I hope that this symposium will lead to the further expansion of the beneficial utilization of Kibo.



Ms. Shiho Ogawa
JAXA JEM Utilization Center/Director

Ms. Ogawa started to work in National Space Development Agency (currently JAXA) in 1987. She has been involved in promoting and planning of the space environment utilization since 1995 and is in charge of recruitment of publicly-offered ground-based research, selection of the theme for “Kibo” utilization, and development of utilization strategy. She has been Director of JEM Utilization Center since April 2018.

I am like a “walking dictionary” since I have been engaged in the planning and promotion of “Kibo” utilization for many years. The



Dr. Koichi Wakata
JAXA/Vice President

He served as JAXA ISS Program Manager from 2016 to 2018 before he was assigned as JAXA Vice President and Director General, Human Spaceflight Technology in 2018. He flew in space four times on Space Shuttle, ISS, and Soyuz. He assumed command of ISS Expedition 39 in 2014 and became the first Japanese ISS Commander.

Japan’s human space activities are now reaching a critical turning point with the promotion of space development by new space fairing countries and an increase in commercial use of LEO. We, at Human Space Flight Technology Directorate (HSFTD) of JAXA, need to further develop human space technologies fully leveraging Japan’s global competence, to pursue the establishment of “Kibo” as a research and development base by providing more accessible utilization services, and to expand cooperation with the private sector, as well as to steadily promote and accelerate efficiency of the “Kibo” operation forecasting future LEO utilization. HSFTD will continue to promote the “Kibo” operation and utilization as well as the HTV operation, JP-US OP3, commercial use of the “Kibo” module, the development and demonstration of technologies for deep space exploration using the “Kibo” module in order to maximize utilization achievements of the ISS. We are committed to actively enhance activities that help results from space exploration take root in society, as well as its arduous research and development intended to help raise awareness for the wide-ranging effects of commercialization and utilization through the operation of “Kibo”.

situation surrounding the space has been changing dramatically in recent years, and many companies are actively engaged in using the space as a place of “Kotozukuri(value creation)”. As a result, ISS and “Kibo” utilization has been expanding the way, which I had never thought as it would have expanded. For that reason, we should never say “We did before” and “This might be difficult” and should always work on a forward-looking attitude. There are many expert engineers and program scientists in space environment utilization. Please consult us what you want to do using the space environment any time.



Mr. Ryotaro Sakata
Nikkei Biotechnology & Business/Deputy Editor

Master’s Degree in biotechnology, Tokyo Institute of Technology(1998). Work as a reporter in the economic field for 21 years. Responsible as a branch manager in Beijing and Shanghai for 5 years

By the Japanese Experiment Module (JEM), known as “Kibo” , industrial use of the universe is not a distant future story for Japanese but also today’s theme. Through this symposium, I would like to deepen concrete discussions.



Prof. Ryoza Nagai
Jichi Medical University/President

1974 University of Tokyo, 1974 University of Tokyo Hospital, 1983 University of Vermont, 1995 Professor, University of Gunma, 1999 Professor, Department of Cardiovascular Medicine, University of Tokyo, 2003 President, The University of Tokyo Hospital, 2012 President, Jichi Medical University

“Kibo” in International Space Station (ISS) is a new base for medical research. One of representative researches in Kibo is drug development based on the protein structure. Kibo is also equipped with state-of-art laboratory instruments which can be used to study effects of microgravity on aging can be investigated. I hope many innovative research will be developed in Kibo with participation of creative scientists.



Prof. Masayuki Yamamoto
Tohoku University Tohoku Medical Megabank
Organization/Executive Director

Tohoku University Tohoku Medical Megabank Organization, Executive Director, 2012–

We achieved a long term breeding (34 days) of 12 mice including gene knockout mice in the ISS “Kibo” for the first time in the world. All the mice successfully returned to the ground alive. Our result is important as it makes a way to utilize various gene knockout/ disease model mice in space, and this success opens the door for “Decade of Space Mouse”. The Space Mouse is expected to accelerate studies for healthy life expectancy in the ground.



Prof. Atsuko Sehara
Kyoto University/Professor

Atsuko Sehara-Fujisawa is a professor of the Institute for Frontier Life and Medical Sciences, Kyoto University, Japan. She has been involved in studies on skeletal muscle regeneration. She is now trying to elucidate mechanisms of skeletal muscle atrophy in space as well as those in aged people and in diseases by using zebrafish. Transcriptome data of skeletal muscle during the space stay from its initial phase towards the recovery phase after return to the earth, obtained for the first time, will tell us novel mechanisms of skeletal muscle atrophy in space and roles of gravity in the maintenance / homeostasis of skeletal muscle on the earth.

We launched zebrafish to the International Space Station for 6 weeks successfully. Those zebrafish amazed us because they learned how to swim in the microgravity much more quickly than we had expected. Transcriptome analyses of them further illustrate robustness and plasticity of living organisms on the earth. These findings have made me happy to be involved in space science.



Dr. Junichi Hosoi
Shiseido Company, Limited/Senior Scientist

Obtained doctoral degree at Univ. Tokyo, worked at NIH and Harvard Univ. in US as a visiting scientist, and then entered Shiseido Company.

We have studied the effects of stress using the confined environment training facility of JAXA and published some new findings. The basic research with JAXA benefits the people on the ground. We wish to take advantage of the stay in LEO and on the moon for the development of the solution to maintain healthy skin.



Dr. Kazumi Nishijima
MOCHIDA PHARMACEUTICAL CO., LTD./
Fellow

Mochida Pharmaceutical Co., Ltd.: Fellow, Japan Society for the Promotion of Science: Inspector General

Since the agreement on the cooperative activities of JAXA and the Protein structure analysis consortium was concluded in 2002, the use of outer space by pharmaceutical companies was promoted. Looking forward to the effective utilization of “Kibo” by industry, academia and government in various life science fields, its outcome and ripple effect.



Dr. Keiichi Masuya
PeptiDream Inc./Executive Vice President

Keiichi Masuya obtained Ph.D. in 1998 (Tokyo Institute of Technology), and Research Fellowship of the Japan Society for the Promotion of Science for Young Scientists (1995–1998). From 1998-2001, he worked at Mitsubishi Pharma. He joined Novartis Pharma Japan in 2001, received an oncology President Award in 2004, then moved to Basel Headquarters of Novartis Pharma in 2005. He received a VIVA award as a Novartis leading scientist in 2012. He managed several development compounds in the field of oncology. He joined PeptiDream Inc. in 2014, currently as Executive Vice President and Board Member.

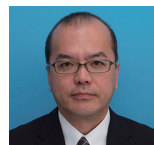
—
The importance of co-crystallization of compounds and proteins and X-ray structure analysis in drug discovery research has been increasing more than ever. It's not too much to say that X-ray structural analysis is essential for drug discovery for, especially, protein-protein interactions and membrane proteins as tough/difficult targets (identification of starting compounds and acquisition of candidate compounds for clinical development by further optimization). On the other hand, however, it is also reality that the crystallization of these proteins themselves as well as co-crystallization with the compound is extremely difficult. We believe that crystallization in the microgravity environment in the Kibo greatly contributes to solving these problems, and we have indeed succeeded in many cases which was believed almost impossible in ground experiments.



Dr. Yasumitsu Sakamoto
Iwate Medical University/Associate professor

PhD in Pharmacy
2002: Assistant professor; Showa University, Japan. 2007: Associate professor; Showa University. 2008: Reseach associate ; Iwate Medical University. 2017: Associate professor; Iwate Medical University. Research field: Structural Biology

—
By the practical application of penicillin in the 1940s, humanity was able to prolong the life-span of dozens of years since the 1950s. Currently, It is said that the era without antimicrobial will come in the very near future. Based on the result of our space experiment from 2011, we have found some compounds that suppress the growth of infectious disease-related bacteria. The experiment was the light of “Kibo”(Hope) for us who were the sufferer of the Great East Japan Earthquake. I sincerely hope that the International Space Station and the Japanese Experiment Module “Kibo” will continue to act as a platform to support the hope and the future of humanity.



Mr. Tatsuya Zenkoh
AMED/Manager

Graduated in Master's Course of Faculty of Pharmaceutical Sciences, Hokkaido University. Joined Astellas Pharma Inc. and engaged in Medicinal Chemistry for over 20 years. Promoting drug discovery in academia at AMED from 2015.

—
So far they have produced numerous achievements in protein crystallization experiments under microgravity. I am looking forward to further achievements. In particular, I would like them to proceed with the development of technologies enabling the fabrication of large crystals for use in the structural analysis of medium size molecules and the crystallization of biocomplex composed of many kinds of molecules. Moreover, as we are entering an aging society, we also have great expectations for aging research.



Mr. Masato Hosoda
INTERPROTEIN CORPORATION/
CEO & PRESIDENT

Interprotein (2005-), Kirin Brewery's Pharma (1989-2005), Schering-Plough Japan (1982-1989), Graduated Hirosaki Univ. (1982)

—
Which nobody can deny X-ray crystallography would be very important to succeed small molecule and/or new modality drug discovery. And we can get new paradigm of productivity of crystallography at a Space experiment work for new generation of drug discovery.



Mr. Tadashi Nakamichi
Cleantech Laboratory, Real Kaihatsu Kaigi/
Editor-in-Chief

Editor in Chief of Real Kaihatsu Kaigi, Nikkei BP Inc. He has 20 years experience as an editor on advanced technology area.

—
The space-related will be strongly growing, but it is very difficult to find a foothold for enterprises to extend to the market now. I am exciting to discuss with you about how we get a business chance on the space-related business at this event.



Mr. Kyohei Iwamoto
Sony Computer Science Laboratories, Inc.

His current work is Research Lead at Sony Computer Science Laboratory. He's concurrently serving as senior researcher at JAXA from 2016. Prior to his current work, he was distinguished resarcher at Sony Corporation, Japan and visiting researcher at Palo Alto Resasrch Center, Inc., USA.

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That was truly impressed and made my mind change, Space startups closer to my office when I was working in United States. Space is almost there in our life. This impactful experience is one of reason why I started space laser communication, however, ecosystem to support such challenge in Japan was still staying as my conceren. Kibo became my second impactful event that help us to accerelate our works as fast as what US do. I hope such infrastructure or supporting ecosystem like utilizing Kibo will become no longer supprizing to help people challenges to space and more to make an impact to our future.



Mr. Yasuhiro Fuchita
OBAYASHI CORPORATION/
Chief Research Engineer

I was born in 1967. 1993, Nagoya University graduate school of engineering, Architectural Engineering. Majored in Concrete engineering. 1993, Entered Obayashi Corporation, work on a concrete material study for construction. Now, I'm engaging in various materials development of the space experiment in Technical Research Institute.

—
Obayashi Corporation announced “The Space Elevator Construction Concept” for an ultimate high structure with construction of Tokyo Sky Tree*. Of these, we assumed the material of the cable and performed an experiment to check durability in the outer space in Exposed Experiment Handrail Attachment Mechanism of “KIBO” in Japan. With such a space experiment, the construction industry investigates a way of step to the space utilization.



Mr. Yohei Oyama
MITSUI & CO.,LTD./General Manager

GM responsible for aviation, space and defense business at Mitsui & Co.'s Mobility Business Unit.

—
Mitsui is undertaking the CubSat deployment services out of the KIBO module, as well as offering rideshare services to micro-sat operators through its US partner, Space Flight Industries, to meet the miscellaneous demand from experimental satellite deployment to commercial satellite deployment.



Dr. Hideki Shimamura
PASCO CORPORATION/President & CEO

B.Sc. from Department of Photography Engineering, Faculty of Engineering; M.Sc. from Graduate School of Engineering and Ph.D. from Graduate School of Natural Science, Chiba University. Dr. Shimamura joined PASCO in 1981. He became the Board of Directors in 2010, Managing Director in 2017 and President and CEO in June 2018 and continuing. He is the Vice President of the Remote Sensing

Society of Japan.

—
The evolution of measurement, measurement technology, and data analysis technology with AI has great expectations as a state-of-the-art technology for creating societies of the future. Especially, the evolution of technology to observe the earth from space is remarkable, and the possibility of utilizing satellites for unobtrusive wide-area coverage and periodic observations are enormously widening. PASCO utilizes remote sensing technology from all perspectives such as earth observation satellites, aircraft, drones, vehicles and ships to create services to solve social problems. And we will take on the challenge in the field of new space utilization based on the experiences and know-how accumulated by handling over 20 satellites, ground stations owned in Hokkaido and Okinawa and the satellite usage business which became full scale since 2005.



Mr. Norimitsu Kamimori
JAXA Human Spaceflight Technology Directorate,
Management and Integration Department/Director

Mr. Kamimori is Director of Integration and Management Department of Human Spaceflight Tech Directorate. His responsibility is Coordination for Policy, Planning, Budget, Public Outreach and Regal matters in this Directorate. Few years ago, he was Head of S&MA and reviewed all of Flight Hardware and Procedures associated ISS/Kibo.

—
Experimental results and fruits from ISS/Kibo are not only beneficial for people's life on ground but also for many kinds of knowledge for future human lives in space. The value of ISS/Kibo will not be decreased by Gateway, which will be realized by NASA, Japan and International Partners in the near future. I believe both activities of going to the lunar surface and popularizing the low earth orbit can be conducted by future human society.



Mr. Jeffrey Manber
NanoRacks/CEO

Jeffrey has served as the CEO of NanoRacks since 2009, growing the company into the first commercial space station company with customers. He brings to the company unique experience in making space just another place to do business. Before NanoRacks, Jeffrey helped establish the Office of Space Commerce with the Reagan Administration’s Department of Commerce, serving as a voice for private industry in space. Afterwards he became the only American to officially work for the Russian space program, serving as Managing Director of Energia USA. Under Jeffrey’s leadership, NanoRacks was a pioneer, and now the leader, in the commercial market for low-Earth orbit utilization. For the future, Jeffrey is increasingly focused on populating the solar system with commercial space station platforms, owned and operated by NanoRacks.

Started as a self-financed private company in a storage facility space in 2009, NanoRacks has disrupted the market for low-earth orbit services. We developed the first US commercial CubeSat deployment program as well as the first commercial successful biomedical program. We have proved that there is a commercial LEO market and have pioneered US/ international commercial participation on the Space Station. Additionally we have developed Unique Operational Expertise in Commercial Relations with NASA, JAXA, and other ISS space agencies. NanoRacks has deployed over 230 satellites from the ISS and has flown over 700 customer payloads on over 35 missions to the ISS. We have installed and commissioned new research and scientific equipment that have resulted in the creation of new business lines. We are currently constructing the Bishop Science Airlock. We look forward to expanding commercial operations through the operational lifetime of the ISS as well as on other platforms in Low Earth Orbit and beyond.



Mr. Junichi Tosaka
Freelance announcer

Junichi Tosaka born Jun 10, 1971 in Tokyo. He joined NHK. In 2003, He transferred Announcers Bureau of Tokyo. He was the caster of “NHK News Ohayo Nippon”, etc. When the Great East Japan Earthquake in 2011, He was a news caster for a month. In 2018, he left NHK.

I think some people have a image that the space is so far and nothing to do with me. Honestly I was so. The only connection with the space is satellite broadcast because I am working for the broadcasting. The situation surrounding the space changed drastically, and the space business is the trend of the world and over 30 countries are investing. The low earth orbit market is more attractive. What can we do? Let’s get interested in the space in 2019



Dr. Kenichiro Mogi
Neuroscientist

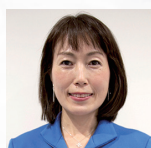
Ken Mogi (Mogi Kenichiro, born October 20, 1962 in Tokyo) graduated from University of Tokyo, got a degree in Physics and Law. Then he studied biophysics at the graduate school of University of Tokyo, obtaining his Ph.D. in 1992. After doing research in Riken and University of Cambridge, he is now a senior researcher at Sony computer science laboratories. He has published many books in Japanese, including “Qualia and the Brain” (Nikkei Science, 1997) and “Brain and Imagination”(Shinchosha, 2004). Ken Mogi was Japan’s first TED speaker. He presented in 2012 March. In 2018, Mogi has published his first book in English titled “Ikigai”

Space exploration has entered a new era where civil and commercial participations propel innovations in the “blue ocean.” Unique experiments and developments in the microgravity environment are powerful engines in the advancement of economy and culture. Aiming to explore space would also prove instrumental in the evolution of the human brain into the next stage. Looking at the earth from space provides a dramatic case of “metacognition” (observing oneself from the outside), and would advance human consciousness. Artificial intelligence might approach singularity on earth. Human consciousness would also evolve towards “cosmic singularity” in its exploration of space.



Prof. Hiroyuki Kishi
Keio University Graduate School of Media Design/Professor

He graduated from the Faculty of Economics, Hitotsubashi University in March 1986. In April of the same year, entered the Ministry of International Trade and Industry. After serving as a secretary of the Minister for Internal Affairs and Communications, Associate Professor at the DMC Integrated Research Organization, Keio University, he was professor of Keio University Graduate School of Media Design in April 2008.



Ms. Naoko Yamazaki
Former JAXA Astronaut

Astronaut. Yamazaki was onboard Space Shuttle Discovery on the crew of STS-131, an assembly & resupply mission to the International Space Station. After retiring from JAXA, Yamazaki has been serving as a member of Japan Space Policy Committee, Co-Founder & Representative Director of Space Port Japan Association, etc.

Having being involved in JAXA Kibo project team before becoming an astronaut, it was a great privilege to participate in the ISS assembly & resupply mission STS-131, delivering experimental equipment and samples to Kibo and returning important samples back on Earth. As a member of

Space Policy Committee, I expect Kibo will be utilized more to demonstrate new technologies, contribute to the society and involve various users.



Dr. Masaki Shirakawa
JAXA/Head of JEM Utilization Planning Group

Dr. Shirakawa started to work in National Space Development Agency of Japan (currently JAXA) in 1994. From 2004 to 2006, he moved to the Directorate of Science and Technology Policy (Secretariat of the Council for Science and Technology Policy) at the Government of Japan’s Cabinet Office. He currently serves as the Head of Kibo Utilization Planning Group.

Dr. Shirakawa has worked on space environment utilization and ISS program since he joined NASDA (currently JAXA). Recently he managed the JAXA Rodent Mission integration Division of the JEM Utilization Center, as well as international coordination for Kibo Utilization. Currently he is responsible for strategic planning of Kibo utilization. He intends to strategically promote Kibo utilization to accumulate prospective outcomes in the fields of science and technology development so that Kibo is widely recognized as an indispensable onorbit R&D platform beneficial for society on Earth and future Japan’s human exploration.



Dr. Dai Shiba
JAXA/Manager

DAI SHIBA, Ph.D., Manager for JAXA Rodent Missions
2004 Assistant Professor/2010 Lecturer, Kyoto Prefectural University of Medicine
2013 Associate Senior Researcher, JAXA
2017 Senior Researcher, JAXA

“Explore to Realize”
I want people to not only “long” for space but also to “feel” closer to space. By 2030, the Japanese population over 75 years old will be expected to increase by 5 million people from now and to exceed 22 million people. I think it is an era that demands people to “live healthy until death” so as not to require support from the working generation as much as possible. In addition to “going higher and farther”, I’d like to make “space utilization” closer to everyone’s life using advanced science technology and I hope everyone to feel space.



Dr. Frances Donovan
NASA/ARC (Space Biology)

I am the Project Scientist for NASA Space Biology, Ames Research Center, with a doctorate in biological sciences.

I lead the Space Biology ISS flight science processes, working with researchers, ISS Research Integration Office, and our implementation partners. Also, I serve as the liaison to JAXA for Space Biology. NASA Space Biology conducts ISS research to advance human space exploration and scientific knowledge using a diversity of non-human model organisms.



Mr. Shinobu Doi
JAXA/Manager

Mr. Doi started to work in National Space Development Agency of Japan (currently JAXA) in 1994. He has been involved in development of “Kibo” robot arm since 1996. Now, he is in charge of integration of JEM exposed systems including Air Lock, and reserach and development in robotics that is necessary for future manned space activities.

I would like to expand function of an easy-to-use technology demonstration platform in user’s perspective, such as expanding the small satellite deployment capability from “Kibo” and adapting the small experimental device in the medium-sized exposure experiment adapter. In addition, by applying commercial technologies of robotics, I want to promote “Kibo” utilization as a demonstration platform of robotic technologies in order to advance future manned space activities efficiently and safely.



Mr. Andres Martinez
NASA/HQ(Advanced Exploration Systems)

Program Executive in the Advanced Exploration Systems (AES) division of the HEOMD at NASA HQ.

At AES, he leads the Small Satellites and he is responsible for several deep space missions, SPHERES and Astrobee (free-flyer robots aboard the International Space Station). Conduct Research and STEM activities using Astrobee. Use Astrobee to assist ISS Crew. Support Japan/US cooperation (JP-US OP3)



Dr. Shinji Kohara
NIMS/ELF PI

Shinji Kohara is a principal researcher at the National Institute for Materials Science (NIMS). He received his M.S. degree in 1995 and his Ph.D. degree in 1998, both from Tokyo University of Science. From 1998 to 2001, he worked as a postdoctoral fellow at the Japan Synchrotron Radiation Research Institute (JASRI), where he was involved in the development of instrumentation for the structure measurement of glassy, liquid, and amorphous materials at the SPring-8 synchrotron radiation facility. From 2001 to 2015, he worked as an instrument scientist at SPring-8. Since 2015, he has been working at NIMS. His current research interests include the inorganic chemistry and materials science of glassy, liquid, and amorphous materials.

We will conduct precise density and viscosity measurements on high-temperature ($T > 2000^{\circ}\text{C}$) melted glassy materials by utilizing the Electrostatic Levitation Furnace (ELF) at the ISS, which cannot be managed on the ground due to gravity. In addition, we will perform structure measurements at SPring-8, J-PARC and SNS of the Oak Ridge National Laboratory, USA, with the aid of computer simulation using the K supercomputer. It is well known that a glass can be obtained from liquid by rapid quenching, but we are not aware of the mechanism of glass formation, neither the nature of glass. The density and viscosity measurements on high-temperature liquids at the ISS are only the first approach to overcome this situation. The density, viscosity, and structural data obtained will be understood by means of informatics. The knowledge to be gained will be crucial key information for the high-throughput production of novel functional glasses, which is the ultimate goal of NIMS. Moreover, it may be possible to accelerate glass production of Japanese industrial companies in the future.



Dr. Doug Matson
ELF PI

Dr. Douglas Matson is an Associate Professor of Mechanical Engineering from Tufts University.

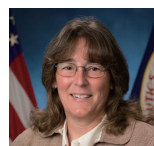
Professor Matson is the chairman of the ESA Investigator Working Group running electromagnetic levitation experiments on the ISS and serves as the president-elect of the American Society for Gravitational and Space Research.



Mr. Sam Scimemi
NASA/ISS Director

Mr. Scimemi is the Director for International Space Station at NASA Headquarters.

His duties include implementing policy and programmatic direction and ensuring safe and productive ISS operations and utilization. He engages with the White House and Congress, as well as international space agency leaders around the world regarding human spaceflight issues.



Ms. Marybeth Edeen
NASA/OZ Manager

Marybeth Edeen, Manager, ISS Research Integration Office

As the ISS Research Integration Office Manager, Ms. Edeen ensures all of the research is integrated and ready to fly to ISS. The ISS averages 300 experiments every 6 months across 6 major subdisciplines and provides benefit for Earth applications and space exploration.



Mr. Tetsuro Yokoyama
JAMSS/Chief Engineer

After working for shipbuilding company, joined JAXA for ISS/Kibo Program in development and then operations/utilization preparation, and was the ISS Program Manager during Kibo initial operations. Still continue to contribute to Japan’s Human Spaceflight activities and promotion of LEO commercialization.

Looking ahead even to a era of commercial platforms in LEO after ISS retires, Japan should pursue international cooperations at both government and private sector level to stimulate demands of and to encourage supply side for commercial activities, in addition to the needs of technological demonstration and basic science.



Mr. Andrew Rush
Made In Space, Inc./CEO

Andrew Rush is President & CEO of Made In Space Inc. He oversees the operations, business development, and strategy of Made In Space (MIS) as it continues to push boundaries of manufacturing technology in space.

As the first manufacturing company to operate in space, MIS is uniquely positioned to unlock the tremendous potential of the space economy by creating the tools, infrastructure and equipment necessary for humankind to build among the stars.



Mr. John Vellinger
Techshot, Inc./CEO

My name is John Vellinger. I am president and CEO of Techshot – a company I co-founded in 1988.

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Techshot, develops, owns and operates equipment used inside the ISS by professional researchers. We have equipment for conducting research in space with rodents, plants, flies, cells, bacteria, tissue chips and crystals. Soon Techshot also will have a 3D BioFabrication Facility installed aboard the ISS.



Mr. Mike Lewis
NanoRacks/Chief Innovation Officer

Michael is currently the Chief Innovation Officer at NanoRacks, LLC, where he is responsible for overseeing the technical, scientific, and imaginative direction for the company. He has developed, built, and flown experiment platforms to the ISS, including the NRCSD (the NanoRacks CubeSat Deployer) system which deploys satellites from the ISS, a satellite deployer that deploys satellites off the Northrup Grumman Cygnus spacecraft, as well as a number of unique space platforms that enable space-based science, research, and education.

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Started as a self-financed private company in a storage facility space in 2009, NanoRacks has disrupted the market for low-earth orbit services. We developed the first US commercial CubeSat deployment program as well as the first commercial successful biomedical program. We have proved that there is a commercial LEO market and have pioneered US/ international commercial participation on the Space Station. Additionally we have developed Unique Operational Expertise in Commercial Relations with NASA, JAXA, and other ISS space agencies. NanoRacks has deployed over 230 satellites from the ISS and has flown over 700 customer payloads on over 35 missions to the ISS. We have installed and commissioned new research and scientific equipment that have resulted in the creation of new business lines. We are currently constructing the Bishop Science Airlock, launching in 2019. We look forward to expanding commercial operations through the operational lifetime of the ISS as well as on other platforms in Low Earth Orbit and beyond.



Mr. Twyman Clemens
Space Tango, Inc./President and CEO

Twyman Clements is the Co-Founder and CEO of Space Tango which builds high value products in microgravity for Earth.

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Twyman oversees the intersection of business and product design at Space Tango which sees the ISS as a incubator to gather directional knowledge, determine valuable applications as well as understand the unit economics of scalable production. Depending on the launch the company operates two to three facilities on ISS and since February 2017 has flown on 10 missions with 64 Payload and 104 experiments run.



Dr. Per Christian Steimle
Airbus/Bartolomeo Program Manager

Program Manager “Bartolomeo All-in-one Space Mission Service”, Airbus Defence and Space GmbH, Germany

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The new Airbus “Bartolomeo” external ISS payload platform is developed for commercial utilization. Becoming available in early 2020, “Bartolomeo” is able to host any payload sizes up to 450 kg in the most versatile and cost-efficient way. Bartolomeo welcomes any commercial and institutional user.



Mr. Masatoshi Nagasaki
Space BD Inc./Co-Founder & CEO

Co-Founder & CEO, Space BD Inc. He founded Space BD in September 2017 as a seasoned expert in business development in diversified business segments such as mining industry and education.

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Space BD was selected by JAXA to be the official service provider of satellite deployment from “Kibo” on the ISS in May 2018 as JAXA’s first commercialization initiative.



Mr. Hiroyuki Iwamoto
JAXA Business Development and Industrial Relations Department/Director

Mr. Iwamoto has been Director of New Enterprise Promotion Department, JAXA since July 2018. He was Director of JAXA Washington, DC Office (2015-2018). His career began in International Space Station (ISS) Program, NASDA in 1991. After that, he worked for commercialization of space activities and promoting space utilization on various fields like ISS, rockets and satellite applications, for many years. He also served as Secretary General of space education at Young Astronauts Club – Japan (YAC)

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JAXA has started “JAXA space innovation through partnership and co-creation program (J-SPARC)” to create new space related businesses under partnership with companies that wish to develop/start new business in space. Kibo has a lot of possibilities for business innovation. Through this program, we expand utilization of low earth orbit including ISS.

主 催

国立研究開発法人 宇宙航空研究開発機構



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