Formulation Process of the SRM

Kentaro Motohara (Chair, SOC/Science Advisory Committee/SRM Committee),
on behalf of SAC / SRM Committee

Greate Efforts of SRM Committee Members are Required in This Process

SRM Committee (together with SAC)

1. 2024/12/15 13:00-16:00
2. 2025/1/21 13:00-16:00
3. 2025/2/10 13:00-16:00
4. 2025/3/10 13:00-16:00
5. 2025/4/18 13:00-16:00
6. 2025/5/16 13:00-16:00
7. 2025/6/23 13:00-16:00
8. 2025/7/14 13:00-16:00
9. 2025/8/21 13:00-16:00
10. 2025/9/19 13:00-16:00
11. 2025/10/22 13:00-16:00
12. 2025/11/26 13:00-16:00

Town Meeting

1. 2025/9/22 12:00-13:00
2. 2025/10/1 12:00-13:00

Process of SRM development
サイエンスロードマップ提案と策定の手続き

- 2024/10/18：Submission deadline of LOI / 提案したいグループがLOIを提出
- 2025/1/31：Submission deadline of detailed “Proposal” / より詳細な「提案書」を提出
  - During the writing period of the proposal, hold the Future Planning Symposium and present the contents of the proposal
    提案書準備期間中に、将来シンポジウムを行い、そこでどのような提案をするかの中間発表
  - SRM Committee provides feedbacks to the prese
    将来シンポジウムの発表に、SRM委員会がフィードバック行う
- 2025/2~6：SRM committee carries out Interviews for each proposal / SRM委員会によるヒアリングを実施
- 2025/11：SRM committee develops a draft SRM / これらを踏まえて、SRM委員会がサイエンスロードマップの素案を作成
- 2025/12：Collect comments from the community through Future Planning Symposium / 将来シンポジウムを開催してサイエンスロードマップ素案への意見収集
- 2026/3 (TBD)：Establish the NAOJ SRM / サイエンスロードマップ策定

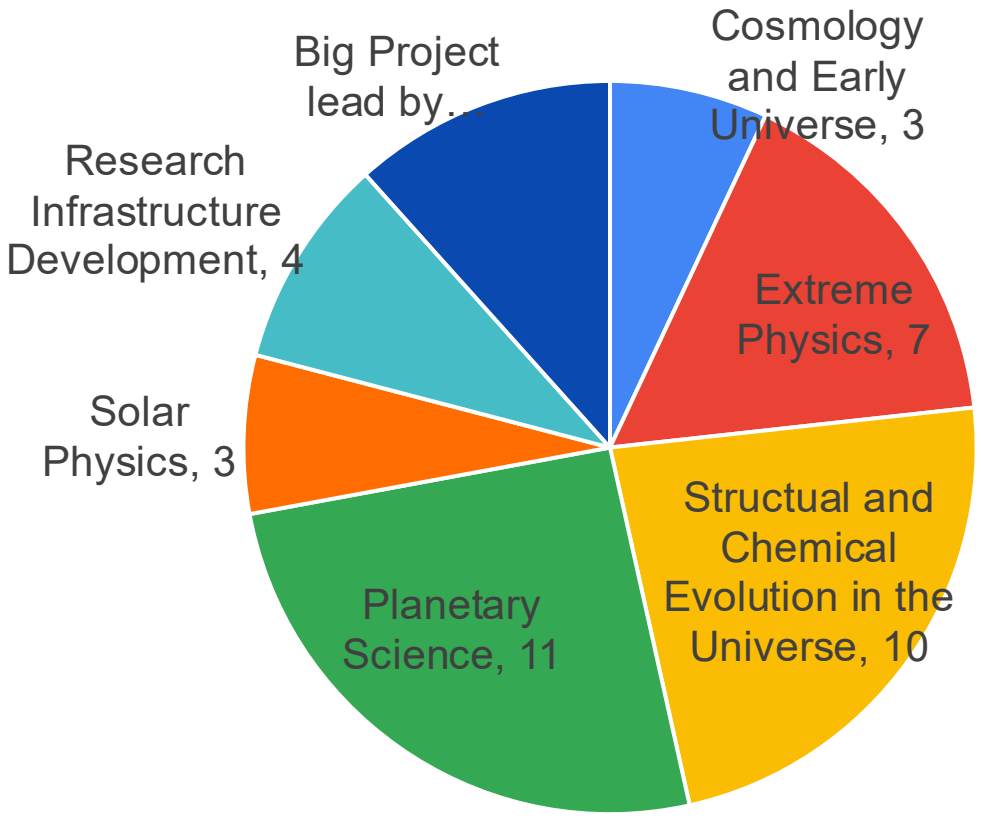
List of the Submitted LOI

- In total, 43 LOIs were submitted

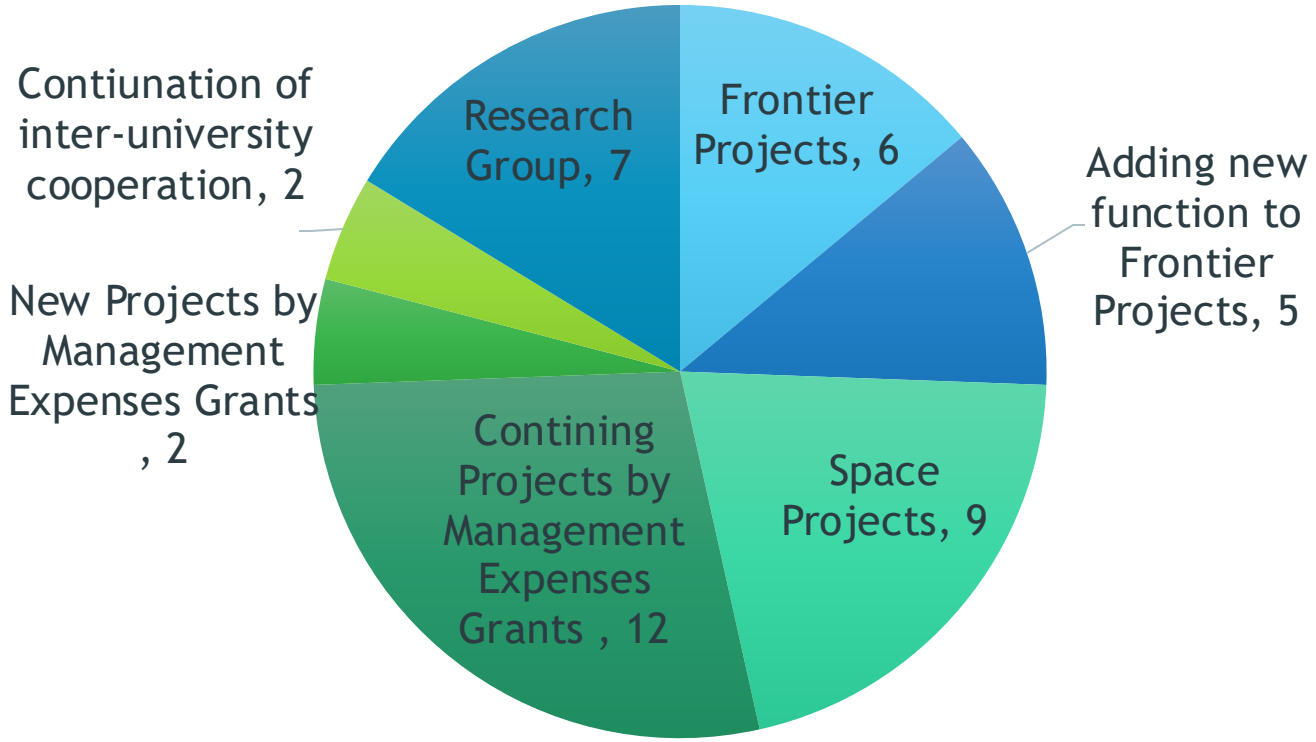
1	Square Kilometre Array Phase 1
2	Advanced R&D hub for future GW detectors with TAMA300
3	Optical and Infrared Synergetic Telescopes for Education and Research (OISTER)
4	Japanese VLBI Network
5	Promoting Gravitational Wave Astronomy with the Gravitational Wave Telescope, KAGRA
6	Third Generation Gravitational Wave Telescopes (3G)
7	Ultra-Doppler - Ultra High Precision Radial Velocity Instrument for Nearby Solar Twins Search
8	Promoting Far Infrared Astronomy by PRIMA
9	The Next Generation Very Large Array (ngVLA)
10	Research Center for Dark Universe Cosmology
11	A base for international residential research workshops and schools for astronomy and astrophysics
12	The Life-environmentology, Astronomy, and PlanetarY Ultraviolet Telescope Assembly (LAPYUTA) mission
13	The Thirty Meter Telescope TMT
14	Exploring the Chemodynamical Evolution of the Milky Way and the Local Group through Wide and Deep Stellar Surveys
15	Galaxy Formation Research Hub: Advancing Galaxy Formation Studies through Projects and Interdisciplinary Research
16	SILVIA:In-orbit Demonstration of Ultra-Precision Formation Flying
17	Participation to NASA Habitable Worlds Observatory
18	Exoplanet Research Hub
19	Revealing the Evolution from Star and Planet Forming Regions to Planetary Systems with Radio and Infrared Observations x Theory
20	Study of the formation of astronomical objects and structures using wide-area/wide-band observations with the Atacama Submillimeter Telescope Experiment (ASTE)
21	ALMA2: Atacama Large Millimeter/submillimeter Array in Exploration of the Origins of the Universe and Life
22	Stable Operation and Upgrade of the Subaru Telescope: From Subaru-2 to Subaru-3
23	Center for multi-messenger astronomy
24	Exploring the Universe by the Next-Generation Simulations
25	Elucidating formation and evolution of celestial bodies using far-infrared and terahertz interferometers
26	Japan Astrometry Satellite Mission for INfrared Exploration
27	Development of ADC world-standard data science platform for large-scale multi-wavelength observation data
28	Characterizing exoplanets through a collaboration between space-based and ground-based telescopes
29	Astronomy with Super-Precise Spectroscopic Observations
30	Study of the formation of astronomical objects and structures through the promotion of the LST/AtLAST project and multi-dimensional submillimeter survey observations
31	Exoplanet Imaging and Characterization with Subaru SCExAO and TMT-PSI
32	Okayama Telescope Cluster - A Hub for Time-Domain Astronomy and Global Collaboration
33	Nobeyama45-m telescope: experimental field for next-generation technologies and astronomy with large-aperture millimeter-wave telescope
34	Infrared Space Telescope GREX-PLUS
35	Lunar Meter-wave Telescope (TSUKUYOMI)
36	Antarctic 30-m THz Telescope project
37	Solar flare X-ray focusing imaging spectroscopy
38	The SOLAR-C Mission
39	Large Space Optical Infrared Telescope
40	Continuous observations of solar activity: HINODE, Mitaka ground-based telescopes, and build-up for future observations
41	radio astronomy with ultra-high angular resolution using EAVN and global VLBI
42	An extension of planetary geodesy side by side with Solar System small body explorations: MMX and Hayabusa2#
43	Subaru HSC-MB+PFS Survey: Exploring Large Scale Structure at high-redshift

Roughly Categorized LOIs
(only for overall view of submitted LOIs)

Science Category



Size and Source of Budget



NAOJ Science Roadmap “Research Plan Proposal”
国立天文台サイエンスロードマップ掲載計画提案書

- The document which provides the basis for inclusion in the SRM

  サイエンスロードマップ記載の根拠となる文書

- 18 items in total listed right
  内容は右の18項目
  - Only the first 11 items at the time of the SRM development

    ただしサイエンスロードマップ提案時は原則最初の１1項目のみ
  - Items beyond 12 will become necessary at the time of implementation plan development

    12項以降は、実施計画策定時には提出を求めるもの：随時準備しておいてください

1. Summary of the proposal (提案のサマリ)
2. Science goals(計画の科学的な大目的)
3. Scientific objectives (計画の科学的目標)
4. Science Investigations (計画が実施する研究)
5. Instruments and data to be returned（装置と最終獲得データ）
6. Originality and international competitiveness
7. Current Status (現在の計画のステータス)
8. Cost assessments, budget line and status
9. Project Organization (組織)
10. Why NAOJ？ (NAOJで実施する必要性)
11. Collaboration and spillover effects outside astronomy (*フロンティア促進事業のみ)
12. Operations (運用)
13. Rationale and trade-off studies
14. Scientific traceability matrix (科学トレーサビリティマトリックス)
15. Technologies
16. Risk Managements
17. Work Breakdown Structure (WBS)
18. Impact to Resources of NAOJ

Submission Deadline was Jan 31, 2025

List of the 42 Submitted Proposals
全提案42件

1	Square Kilometre Array Phase 1
2	Advanced R&D hub for future GW detectors with TAMA300
3	Optical and Infrared Synergetic Telescopes for Education and Research (OISTER)
4	Japanese VLBI Network
5	Promoting Gravitational Wave Astronomy with the Gravitational Wave Telescope, KAGRA
6	Third Generation Gravitational Wave Telescopes (3G)
7	Ultra-Doppler - Ultra High Precision Radial Velocity Instrument for Nearby Solar Twins Search
8	[redacted] <= Retracted
9	The Next Generation Very Large Array (ngVLA)
10	Research Center for Dark Universe Cosmology
11	A base for international residential research workshops and schools for astronomy and astrophysics
12	The Life-environmentology, Astronomy, and PlanetarY Ultraviolet Telescope Assembly (LAPYUTA) mission
13	The Thirty Meter Telescope TMT
14	Exploring the Chemodynamical Evolution of the Milky Way and the Local Group through Wide and Deep Stellar Surveys
15	Galaxy Formation Research Hub: Advancing Galaxy Formation Studies through Projects and Interdisciplinary Research
16	SILVIA:In-orbit Demonstration of Ultra-Precision Formation Flying
17	Participation to NASA Habitable Worlds Observatory
18	Exoplanet Research Hub
19	Revealing the Evolution from Star and Planet Forming Regions to Planetary Systems with Radio and Infrared Observations x Theory
20	Study of the formation of astronomical objects and structures using wide-area/wide-band observations with the Atacama Submillimeter Telescope Experiment (ASTE)
21	ALMA2: Atacama Large Millimeter/submillimeter Array in Exploration of the Origins of the Universe and Life
22	Stable Operation and Upgrade of the Subaru Telescope: From Subaru-2 to Subaru-3

23	Center for multi-messenger astronomy
24	Exploring the Universe by the Next-Generation Simulations
25	Elucidating formation and evolution of celestial bodies using far-infrared and terahertz interferometers
26	Japan Astrometry Satellite Mission for INfrared Exploration
27	Development of ADC world-standard data science platform for large-scale multi-wavelength observation data => Large Scale Wide Field Observation Study Team <= Modified
28	Characterizing exoplanets through a collaboration between space-based and ground-based telescopes
29	Astronomy with Super-Precise Spectroscopic Observations
30	Study of the formation of astronomical objects and structures through the promotion of the LST/AtLAST project and multi-dimensional submillimeter survey observations
31	Exoplanet Imaging and Characterization with Subaru SCExAO and TMT-PSI
32	Okayama Telescope Cluster - A Hub for Time-Domain Astronomy and Global Collaboration
33	Nobeyama45-m telescope: experimental field for next-generation technologies and astronomy with large-aperture millimeter-wave telescope
34	Infrared Space Telescope GREX-PLUS
35	Lunar Meter-wave Telescope (TSUKUYOMI)
36	Antarctic 30-m THz Telescope project
37	Solar flare X-ray focusing imaging spectroscopy
38	The SOLAR-C Mission
39	Large Space Optical Infrared Telescope
40	Continuous observations of solar activity: HINODE, Mitaka ground-based telescopes, and build-up for future observations
41	radio astronomy with ultra-high angular resolution using EAVN and global VLBI
42	An extension of planetary geodesy side by side with Solar System small body explorations: MMX and Hayabusa2#
43	Subaru HSC-MB+PFS Survey: Exploring Large Scale Structure at high-redshift

Selection Criteria of the Proposals (Before the Interviews)
SRM提案の選定基準 (ヒアリング開始時)

Modified through discussions in the SRM committee
Will be presented tomorrow

1. Selection of LOIs / ロードマップへの掲載選定

- Decision of “to be/not to be” will be made. / 掲載される/されないという判断をする。
  No ranking, but two-lever priority will be given among the selected. (changed since the last Future Symposium)
  順位づけはしないが、掲載されるものについては二段階の優先順位をつける (昨年の将来シンポジウム時からの変更)
- Evaluation Points for the Selection / 選定にあたっての評価ポイント

(1) Scientific Significance : Is the scientific significance clear? / 科学意義が明確になっているか

(2) NAOJ necessity : Is there a necessity for implementation at NAOJ/ whether NAOJ facilities are being utilized ? / 国立天文台で実施する必然性があるか/国立天文台の施設を活かしているか

(3) International Competitiveness : Is it internationally competitive? /

(4) Next Generation Development : Does it contribute to the development of the next generation of researchers? / 次世代研究者の育成に資するか

(5) Technically Readiness : Is it technologically ready? / 技術的な準備ができているか

(6) Identifying Resource : Is the necessary budget and manpower figured out? / 必要な予算・人材リソースが把握できているか

(7) Implementation plan clearness : Is there a clear plan for implementation during the next mid-term plan period (FY2028-2033)? / 次期中期計画期間（2028－2033年度）において実施しようとする内容が明確か

SRM Committee evaluates the proposals based on the above items and decides whether to list or not.

上記項目をもとにSRM委員会が提案を比較検討して掲載・不掲載を決定

Interview for Each Proposal
各提案に対するヒアリング

- Format / 実施形式
  - Prior to the interview, reviewers (2-6) and assistant reviewers (a few) send a RIX (Review Item Comment/Question/Discrepancy) list to the proposers.
    ヒアリング前に、主担当(2~6名)と副担当者(若干名)が中心となって、RIX (Review Item Commet/Question/Discrepance)リストを作成し、送付する。
  - The assistant reviewers are selected through self nomination or appointment by the reviewers
    副担当者は立候補および主担当者からの指名で決定する
  - In the interview, proposers give a presentation on the responses to the RIX /
    ヒアリングでは、このRIXへの回答のプレゼンテーションをしてもらう
  - The interview will last one hour and will be attended by the reviewers /
    ヒアリングは1時間、主担当者が出席して行う
- Proposals are prioritized in the following order, starting with the highest priority /
  優先度を以下の順として、高いもの順に行う
  - “Proposals to be funded by Management Expenses Grants (>100 million yen/year)” (6 reviewers)
    「運営費交付金(>1億円/yr) 」 (主担当6名)
  - “Frontier and related proposals” (6)
    「フロンティアとその関連提案」(主担当6名)
  - “Proposal to be funded by Management Expenses Grants(<100 million yen/year)” (3)
    「運営費交付金(<1億円/yr)」(主担当3名)
  - “Space/ground-based proposals funded by external funds” (2)
    「外部資金で行うスペース/地上計画」(主担当2名)

Interview Schedule

- March 24 2025~June 6
- 1hour per interview
- All the interviews are recorded for a view for other committee members

2025/3/24 15:00-16:00	36	Antarctic 30-m THz Telescope project
2025/3/24 16:00-17:00	26	Japan Astrometry Satellite Mission for INfrared Exploration
2025/3/24 16:00-17:00	33	Nobeyama45-m telescope: experimental field for next-generation technologies and astronomy with large-aperture millimeter-wave telescope
2025/3/26 14:00-15:00	5	Promoting Gravitational Wave Astronomy with the Gravitational Wave Telescope, KAGRA
2025/3/26 14:00-15:00	41	radio astronomy with ultra-high angular resolution using EAVN and global VLBI
2025/3/26 15:00-16:00	6	Third Generation Gravitational Wave Telescopes (3G)
2025/3/27 8:00-9:00	27	Large Scale Wide Field Observation Study Team
2025/4/10 10:00-11:00	2	Advanced R&D hub for future GW detectors with TAMA300
2025/4/10 11:00-12:00	43	Subaru HSC-MB+PFS Survey: Exploring Large Scale Structure at high-redshift
2025/4/10 9:00-10:00	14	Exploring the Chemodynamical Evolution of the Milky Way and the Local Group through Wide and Deep Stellar Surveys
2025/4/10 9:00-10:00	31	Exoplanet Imaging and Characterization with Subaru SCExAO and TMT-PSI
2025/4/16 10:00-11:00	24	Exploring the Universe by the Next-Generation Simulations
2025/4/16 10:00-11:00	25	Elucidating formation and evolution of celestial bodies using far-infrared and terahertz interferometers
2025/4/16 11:00-12:00	1	Square Kilometre Array Phase 1
2025/4/16 9:00-10:00	13	The Thirty Meter Telescope TMT
2025/4/16 9:00-10:00	23	Center for multi-messenger astronomy
2025/4/17 10:00-11:00	21	ALMA2: Atacama Large Millimeter/submillimeter Array in Exploration of the Origins of the Universe and Life
2025/4/17 11:00-12:00	22	Stable Operation and Upgrade of the Subaru Telescope: From Subaru-2 to Subaru-3
2025/4/17 9:00-10:00	4	Japanese VLBI Network
2025/4/7 13:00-14:00	9	The Next Generation Very Large Array (ngVLA)
2025/5/14 13:00-14:00	7	Ultra-Doppler - Ultra High Precision Radial Velocity Instrument for Nearby Solar Twins Search
2025/5/14 14:00-15:00	28	Characterizing exoplanets through a collaboration between space-based and ground-based telescopes
2025/5/15 10:00-11:00	16	SILVIA:In-orbit Demonstration of Ultra-Precision Formation Flying
2025/5/15 11:00-12:00	17	Participation to NASA Habitable Worlds Observatory
2025/5/15 11:00-12:00	19	Revealing the Evolution from Star and Planet Forming Regions to Planetary Systems with Radio and Infrared Observations x Theory
2025/5/15 9:00-10:00	12	The Life-environmentology, Astronomy, and PlanetarY Ultraviolet Telescope Assembly (LAPYUTA) mission
2025/5/15 9:00-10:00	20	Study of the formation of astronomical objects and structures using wide-area/wide-band observations with the Atacama Submillimeter Telescope Experiment (ASTE)
2025/5/21 13:00-14:00	42	An extension of planetary geodesy side by side with Solar System small body explorations: MMX and Hayabusa2#
2025/5/22 10:00-11:00	29	Astronomy with Super-Precise Spectroscopic Observations
2025/5/22 11:00-12:00	40	Continuous observations of solar activity: HINODE, Mitaka ground-based telescopes, and build-up for future observations
2025/5/22 9:00-10:00	35	Lunar Meter-wave Telescope (TSUKUYOMI)
2025/6/2 13:00-14:00	15	Galaxy Formation Research Hub: Advancing Galaxy Formation Studies through Projects and Interdisciplinary Research
2025/6/2 13:00-14:00	30	Study of the formation of astronomical objects and structures through the promotion of the LST/AtLAST project and multi-dimensional submillimeter survey observations
2025/6/2 13:00-14:00	32	Okayama Telescope Cluster - A Hub for Time-Domain Astronomy and Global Collaboration
2025/6/2 16:00-17:00	37	Solar flare X-ray focusing imaging spectroscopy
2025/6/30 10:00-11:00	11	A base for international residential research workshops and schools for astronomy and astrophysics
2025/6/30 9:00-10:00	10	Research Center for Dark Universe Cosmology
2025/6/5 10:00-11:00	3	Optical and Infrared Synergetic Telescopes for Education and Research (OISTER)
2025/6/5 11:00-12:00	39	Large Space Optical Infrared Telescope
2025/6/5 9:00-10:00	34	Infrared Space Telescope GREX-PLUS
2025/6/6 13:00-14:00	18	Exoplanet Research Hub
2025/6/6 15:00-16:00	38	The SOLAR-C Mission

Evaluation of proposals based on the interviews
ヒアリングによる各提案の評価

- In addition to the reviewers attended interviews, several more reviewers are assigned who watch the video records and provide additional scores and comments.
  Total numbers of reviewers are :
  - “Large Scale Management Expenses Grants Proposals(>100 JPY/yr)” (6+4=10 reviewers)
    「運営費交付金(>1億円/yr) 」 (主担当6名+4名 = 10名)
  - “Frontier Projects and Related Proposals] (6+4=10)
    「フロンティアとその関連提案」(主担当6名+4名=10名)
  - “Large Scale Management Expenses Grants Proposals(<100 JPY/yr)” (3)
    「運営費交付金(<1億円/yr)」(主担当3名)
  - “External Fund Proposals (Ground-based/Space)” (2+1=3)
    「外部資金で行うスペース/地上計画」(主担当2名+1名=3)
- Seven criteria is scored out of 10 points / ７つの評価軸について各10点満点で採点
  (1)Scientific Significance, (2) NAOJ necessity (3) International Competitiveness, (4) Next Generation, (5) Technically Readiness, (6) Identifying Resource, and (7) Implementation plan clearness
- 主担当者は講評を記述
  The reviewers are also responsible for providing a written evaluation.

Draft Contents of SRM Report
サイエンスロードマップ報告書の構成

- Contents :
  - Abstract / 要約
  - Chapter 1 :
    Background, Purpose, and Procedure of SRM / サイエンスロードマップの背景と目的、手続き
  - Chapter 2 :
    Global Trends in Astronomy Research / 世界的な天文学の動向
    <= by science field / サイエンス分野ごとに
  - Chapter 3 :
    NAOJ Science Strategies / 国立天文台の科学戦略
    - 3.1 Science strategy of each science field /分野ごとの科学戦略
    - 3.2 Proposals and their Classification /提案とその優先度
    - 3.3 beyond 5th Mid-term Plan Period / 第６期中期計画以降に向けて
  - Summary / まとめ

"サイエンスロードマップ"本体に当たる部分
Main body of SRM

Science Field Classification
サイエンス分野わけ

- Cosmology / 宇宙論
- Galaxy Formation and Cosmic Evolution / 銀河形成と宇宙進化
- Compact Objects, Extreme Physics, and MMA /高密度天体・極限物理・MMA
- Star and Planet Formation / 星惑星系形成
- Sun and Stars / 太陽と星
- Planetary Systems and Life in the Universe /惑星系と宇宙における生命

Authors of the Report

- Chapter 2 : Global Trends in Astronomy Research
  - Cosmology : Kazunori Kohri
  - Galaxy Formation and Cosmic Evolution : Masami Ouchi
  - Compact Objects, Extreme Physics, and MMA : Nozomu Tominaga
  - Star and Planet Formation : Hideko Nomura, Nanase Harada
  - Sun and Stars : Ryoko Ishikawa, Yukio Katsukawa, Noriyuki Narukage, Masumi Shimojo
  - Planetary Systems and Life in the Universe : Masahiro Ikoma and Yuka Fujii
- Chapter 3 :
  - Cosmology : Masahiro Takada
  - Galaxy Formation and Cosmic Evolution : Masayuki Akiyama
  - Compact Objects, Extreme Physics, and MMA : Tomonori Totani
  - Star and Planet Formation : Tomoka Tosaki
  - Sun and Stars : Hideyuki Hotta
  - Planetary Systems and Life in the Universe : Yuka Fujii

Future Schedule

- After the symposium : December 2025~ January 2026
  The committee gathers feedbacks regarding the decision process of SRM through public comments
  将来シンポジウムを受けたSRM策定手続きに対するフィードバックをパブリックコメントなどで収集
- Early February (TBD) :
  Release of the final draft SRM report
  SRM報告書最終案の提示
- February (TBD) :
  The committee gathers opinions through town meetings and public comments
  タウンミーティングを実施するとともに、ウェブフォーム、電子メール等で意見収集
- End of March 2026 :
  Release of the final SRM report
  SRM報告書最終版の発表

Send your comments and opinions to NAOJ SRM committee
意見送付先：国立天文台SRM策定委員会
srm-committee@ml.nao.ac.jp

SRM策定タイムライン
Timeline of NAOJ SRM Development