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S.NO.	TOPIC
1.	INDIA-AUSTRALIA RELATIONS
2.	NASA EXPERIMENT WILL STUDY 'AIR GLOW' TO UNDERSTAND SPACE WEATHER
3.	PRELIMS POINTERS

INDIA-AUSTRALIA RELATIONS

SOURCE: [INDIAN EXPRESS](#)

WHY IN NEWS?

Defence Minister Rajnath Singh and Australian Deputy Prime Minister Richard Marles discussed enhanced cooperation in information exchange and Maritime Domain Awareness (MDA) during the **second India-Australia 2+2 Ministerial Dialogue**, which also involved External Affairs Minister S Jaishankar.

BACKGROUND OF INDIA-AUSTRALIA RELATIONS:

➤ Overview:

- ✓ India and Australia share commonalities as **vibrant democracies with secular, multicultural societies**.
- ✓ The relationship has **strengthened since India's economic reforms in the 1990s**, spanning trade, energy, science, technology, education, and defence.
- ✓ Both nations have historical commercial **ties dating back to the 18th century**.



➤ Historical Contacts:

- ✓ Commercial ties between India and Australia date back to the 18th century, with **India playing a vital role in supporting the young Australian colony**.
- ✓ India was a **crucial source of food and provisions for Australia** in the 19th century.
- ✓ Diplomatic offices, including the Consulate General of India in Sydney and Melbourne, were established in the mid-20th century.

➤ Diplomatic Relations:

- ✓ Diplomatic ties between India and Australia were initiated **in the pre-Independence era, marked by the establishment of the India Trade Office in Sydney in 1941**.

➤ Strategic Partnership:

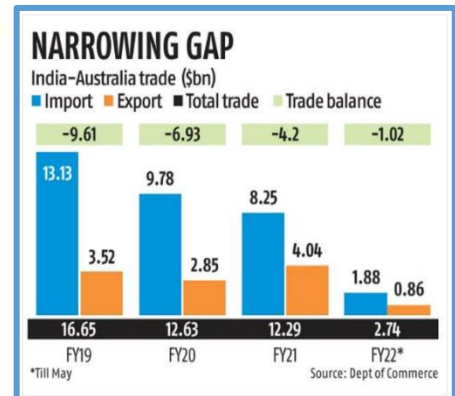
- ✓ In 2009, **India and Australia elevated their relationship to a 'Strategic Partnership'** and later to a **'Comprehensive Strategic Partnership' (CSP) in 2020**.
- ✓ The **CSP involves regular '2+2' meetings** between Foreign and Defence Ministers.

➤ Economic and Trade Relations:

- ✓ **Australia's India Economic Strategy to 2035**, commissioned in 2018, aims to strengthen economic ties.
- ✓ Bilateral trade, with **India as the 8th largest partner**, witnessed a deficit of **\$8.5 billion in FY22**.
- ✓ The **Economic Co-operation and Trade Agreement (ECTA)**, signed in April 2022, **targets doubling trade to \$50 billion**.

➤ Civil Nuclear Cooperation:

- ✓ The **Civil Nuclear Cooperation Agreement signed in 2014** facilitates substantial energy trade between India and Australia.





- **Defence Collaboration:**
 - ✓ Defence cooperation **expanded after PM Modi's 2014 visit**, covering research, development, and industry engagement.
 - ✓ **Agreements like Mutual Logistics Support (MLSA)** and cooperation in Defence Science and Technology were finalized.
 - ✓ **Bilateral naval exercise 'AUSINDEX'** commenced in 2015, showcasing joint maritime capabilities.
- **Cultural Artifact Repatriation:**
 - ✓ India and Australia have successfully repatriated several cultural artifacts in recent years, including the **Bronze Idol of Nataraja and Dwarpala stone sculptures**, reflecting a commitment to preserving cultural heritage.
- **Indian Community in Australia:**
 - ✓ The Indian community in Australia, **numbering around seven hundred thousand**, plays a significant role.
 - ✓ India is a **major source of skilled immigrants**, with a growing population of Indian students, reaching **approximately 105,000 in Australian universities**.
 - ✓ In 2020, **India became the second-largest migrant group in Australia after England**.

INDIA-AUSTRALIA 2+2 MINISTERIAL DIALOGUE:

- **Dialogue Overview:**
 - ✓ Defence Minister Rajnath Singh and External Affairs Minister S Jaishankar held the **second India-Australia 2+2 Ministerial Dialogue**.
- **Key Agendas:**
 - ✓ Discussions focused on **deepening bilateral ties in defence, security, trade, investment, critical minerals, energy, climate change, science and technology, space, education, and people-to-people linkages**.
 - ✓ Regional and global issues were also part of the agenda.
- **Military History Connection:**
 - ✓ Acknowledgment of the **longstanding military relations**, highlighting instances of Australian soldiers fighting alongside **Indian troops, including at Gallipoli**.
- **Crucial for the Region:**
 - ✓ Emphasis on India being central and crucial to the region, **working towards a peaceful, stable, and prosperous environment with respect for sovereignty**.
- **Bilateral Achievements:**
 - ✓ Mention of **collaborative efforts in economic ties, trade, investment, climate initiatives**, and people-to-people links, with a commitment to furthering cooperation.
- **Open Discussions:**
 - ✓ **Open discussions on recent Indo-Pacific strategic developments, West Asia dynamics**, and even sharing a light moment about the recent cricket match.



SIGNIFICANCE OF AUSTRALIA:

- **Indo-Pacific Stability:**
 - ✓ Both India and Australia **advocate for a free, open, and prosperous Indo-Pacific**, evident in their **active participation in the QUAD grouping**, aimed at addressing regional challenges, particularly in response to China's actions.
- **Gateway to Pacific Countries:**



- ✓ Strengthening cooperation provides India enhanced **access to Pacific Island nations**, leveraging **Australia's influence over countries like Kiribati and Solomon Islands**.
- **Indian Diaspora Influence:**
 - ✓ The sizable Indian diaspora in Australia, **constituting 2.8% of the population**, underscores the **importance of collaborative efforts to ensure their well-being and development**, fostering stronger ties.
- **Geo-Strategic Collaboration:**
 - ✓ **Australia's geographical proximity to the Indian Ocean** makes active engagement crucial for India's strategic positioning.
 - ✓ Collaboration is sought for **India's strength in the Indian Ocean and support for initiatives like NSG membership and UNSC reforms**.
- **Energy Security Through LNG:**
 - ✓ **Australia's secure and long-term LNG supply offers India a strategic opportunity** to diversify its energy sources, reducing dependence on the Middle East.
- **Balancing China and Defying Coercion:**
 - ✓ Both countries recognize and **respond to China's ambitions in the Indo-Pacific**, with Australia actively seeking to balance and restrain China.
 - ✓ India is seen as a **pivotal partner in countering China's economic coercion** and regional dominance.

CHALLENGES IN INDIA AUSTRALIA RELATIONS:

- **Shifting Dynamics:**
 - ✓ **Deterioration of Australia-China ties** mirrored India's challenges.
 - ✓ Led to forging a **Comprehensive Strategic Partnership in 2020**.
- **Quad Cooperation:**
 - ✓ **Quad (India, Australia, Japan, U.S.)** pivotal in current geopolitics.
 - ✓ Joint statements and expanded **agendas foster closer alignment**.
- **Economic Challenges:**
 - ✓ Economic ties limited; **coal exports dominate**.
 - ✓ Plans for Indian-controlled **global supply chains face setbacks**.
- **Security Cooperation Hurdles:**
 - ✓ India's reliance on **Russian weapons hinders deeper cooperation**.
 - ✓ **India's stance on Ukraine adds complexity to strategic alignment**.
- **Trade Agreement and Technology:**
 - ✓ Negotiating full **free trade agreement faces hurdles**.
 - ✓ Divergent approaches to **technology policies pose challenges**.
- **Cognitive Dissonance:**
 - ✓ Promotion of India as a **vibrant liberal democracy faces challenges**.
 - ✓ Trivialization and **avoidance strategies in political discourse**.
- **Future Outlook:**
 - ✓ Relationship no longer neglected but faces ongoing complexities.
 - ✓ **Divergences in geopolitical and economic interests persist**.



WAY FORWARD:

- **Enhancing Economic Competitiveness:**
 - ✓ To compete effectively, **India must enhance competitiveness.**
 - ✓ Notable competition from **countries with existing FTAs with Australia.**
- **Mitigating Religious Polarization:**
 - ✓ **Addressing religious polarization** crucial for internal harmony.
 - ✓ Similar to **concerns raised by India about religious tensions in Australia.**
- **Diplomatic Outreach for Tax Reform:**
 - ✓ Actively engage diplomatically to **ensure Australia amends tax laws.**
 - ✓ Focus on **preventing taxation of offshore income** from Indian technical services.
- **Promoting Science & Tech Collaboration:**
 - ✓ **Leverage existing collaborations** for mutual benefit in innovation.
 - ✓ Align with **Australia's National Innovation and Science Agenda.**
- **Space Cooperation Opportunities:**
 - ✓ Explore collaborations in **the commercial space sector.**
 - ✓ India well-positioned to **support Australia's space initiatives.**
- **Strategic Dialogue on Shared Interests:**
 - ✓ Regular strategic discussions **crucial for addressing shared concerns.**
 - ✓ **Prioritize collaboration on issues related to China, Pakistan, Afghanistan, terrorism, and maritime security.**
- **Bilateral Security Declaration:**
 - ✓ **Formalize security commitments** through a bilateral declaration.
 - ✓ **Reciprocal engagement as a priority maritime partner** urged by Australia.





NASA EXPERIMENT WILL STUDY 'AIR GLOW' TO UNDERSTAND SPACE WEATHER

SOURCE: [INDIAN EXPRESS](#)

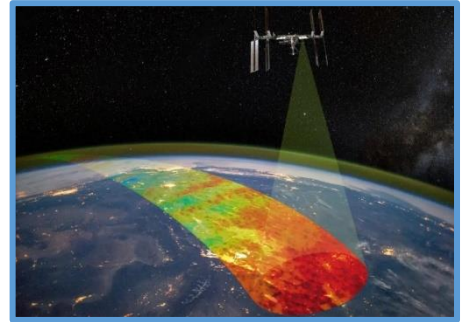
WHY IN NEWS?

NASA's AWE project has garnered attention due to its aim to study Earth's weather as a significant driver of Space weather. The project's focus on understanding the interplay between terrestrial and Space weather makes it noteworthy.

NASA'S AWE MISSION FOR SPACE WEATHER STUDY:

➤ Overview:

- ✓ NASA's Atmospheric Waves Experiment (AWE) is designed to explore the connections between Earth's weather and Space weather, emphasizing the study of atmospheric waves.
- ✓ AWE's focus on the interplay between lower atmospheric waves and their impact on the upper atmosphere makes it a pioneering mission.



➤ Significance of Space Weather Monitoring:

- ✓ The escalating reliance on satellite-based services for communication and navigation underscores the critical importance of monitoring Space weather.
- ✓ Space weather events directly influence key Earth installations, including satellite communication, radio communication, and power grids.

➤ Drivers of Space Weather:

- ✓ Space weather is driven by various factors, including solar flares, emissions from the Sun, and the composition of matter in Space.
- ✓ Terrestrial weather conditions can also contribute to extreme events in Space weather, impacting vital Earth infrastructure.

ATMOSPHERIC WAVES EXPERIMENT (AWE):

➤ Nature of AWE:

- ✓ AWE is NASA's groundbreaking experiment within the Heliophysics Explorers Program.
- ✓ The \$42 million mission aims to explore the intricate interactions between terrestrial and Space weather.

➤ Mission Objectives:

- ✓ Focuses on studying how waves in the lower atmosphere influence the upper atmosphere and Space weather dynamics.

➤ Implementation and Location:

- ✓ AWE will be launched and affixed to the exterior of the International Space Station (ISS).
- ✓ Positioned on the ISS allows AWE to observe Earth and capture airglow phenomena, characterized by colourful light bands.

➤ Airglow Measurement:

- ✓ AWE will measure airglow at the mesopause, approximately 85 to 87 km above Earth's surface.

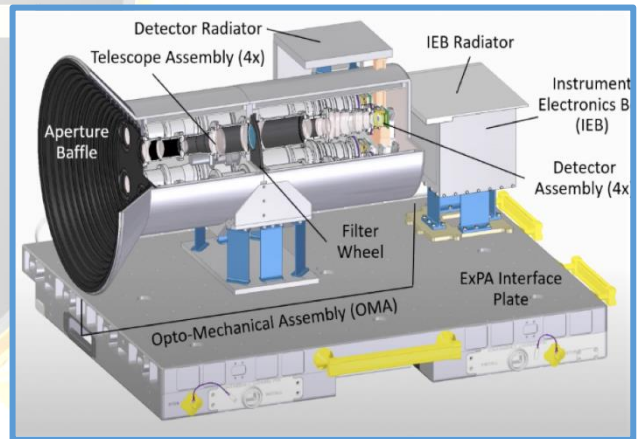




- ✓ The mesopause region experiences temperatures plummeting to **minus 100 degrees Celsius**.
- **Infrared Detection:**
 - ✓ Operating in the infrared bandwidth, **AWE can detect faint airglow**, which appears brightest at the specified altitude.
- **Horizontal Scale Resolution:**
 - ✓ **AWE possesses the capability to resolve waves at finer horizontal scales** compared to traditional satellite observations.
- **Unique Contribution:**
 - ✓ The mission's uniqueness lies in its ability to offer insights into the forces propelling **Space weather** from both terrestrial and upper-atmospheric perspectives.
- **Ionosphere Health Assessment:**
 - ✓ **AWE endeavors to contribute to the understanding of the ionosphere's health**, crucial for maintaining uninterrupted communication.
- **Impact of Transient Events:**
 - ✓ Scientists aim to **ascertain whether the ionosphere is affected by transient events or intense perturbations** resulting from phenomena like hurricanes or tornadoes.
- **Launch Schedule:**
 - ✓ **Originally scheduled for August 2022**, the new launch is anticipated to occur this month.

FUNCTIONS OF NASA'S AWE:

- AWE maps **vibrant airglows in Earth's atmosphere with precision**.
- It uses the **Advanced Mesospheric Temperature Mapper (ATMT)** for scanning the **mesopause region**.
- **Four identical telescopes** are integrated into an **imaging radiometer setup**.
- Scientists collect data on **light brightness at specific wavelengths**.
- Processed data generates a temperature map.
- The temperature map provides **insights into airglow movement and dynamics**.
- **AWE contributes valuable clues about airglow's role in the upper atmosphere and Space weather**.
- Mapping efforts and temperature data **enhance scientific understanding of atmospheric interactions**.
- Deployment of four telescopes **allows comprehensive examination of airglow characteristics**.
- AWE's overarching goal is to advance knowledge about **Earth's atmospheric behavior and its connection to Space weather dynamics**.



ISRO'S FUTURE PLANS:

<i>Major Missions</i>	<i>Description</i>
<i>Modified LVM-3 Flights (Gaganyaan Tests)</i>	<ul style="list-style-type: none"> ✓ Two flights of modified LVM-3 to test the crew escape system for the Gaganyaan mission.
<i>XPoSat Satellite</i>	<ul style="list-style-type: none"> ✓ India's first dedicated polarimetry mission, set to launch in 2023. ✓ Aims to explore the dynamics of astronomical X-ray sources. ✓ Developed in collaboration between ISRO and the Raman Research Institute (RRI), positioned in a low Earth orbit covering 500-700 km.



<i>SSLV Developmental Flight</i>	<ul style="list-style-type: none">✓ Capable of launching up to 500 kg satellites to low Earth orbit.✓ A three-stage solid rocket vehicle with a liquid propulsion-based velocity trimming module.
<i>NISAR Satellite</i>	<ul style="list-style-type: none">✓ A collaborative initiative between NASA and ISRO.✓ A dual-frequency synthetic aperture radar on an Earth observation satellite in Low Earth Orbit (LEO).✓ Used for remote sensing and understanding natural processes on Earth.
<i>Gaganyaan G1 and G2 Flights</i>	<ul style="list-style-type: none">✓ Human-rated LVM-3 rocket flights without crew as part of the Gaganyaan mission.
<i>GSAT-20 Satellite</i>	<ul style="list-style-type: none">✓ Collaboration between ISRO Satellite Centre and Liquid Propulsion Systems Centre.✓ Set to become ISRO's first satellite to transition from a geostationary transfer orbit (GTO) to a geosynchronous orbit through Electric Propulsion.
<i>Lunar Polar Exploration (LUPEX) Mission</i>	<ul style="list-style-type: none">✓ Collaboration between ISRO and JAXA (Japan Aerospace Exploration Agency).✓ An extension of Chandrayaan-3 involving a sophisticated Lander and rover to study the moon's South Polar Region, including subsurface sample extraction and 'night survival' demonstration.✓ JAXA provides launch vehicle and rover, while ISRO provides the Lander.
<i>Mars Return Mission</i>	<ul style="list-style-type: none">✓ Planned return to Mars for further exploration.
<i>Venus Mission ('Shukrayaan')</i>	<ul style="list-style-type: none">✓ Planned mission to study Venus.
<i>Other Collaborations</i>	<ul style="list-style-type: none">✓ ISRO's involvement in launching OneWeb satellites (2022) and the expected launch of European Space Agency's PROBA-3 satellites (2024) as alternative providers due to sanctions on Russia.





PRELIMS POINTERS:

Topic	Details
<p>CENTRAL ADOPTION RESOURCE AUTHORITY (CARA)</p>	<p>WHY IN NEWS? Supreme Court questioned the “great delay” plaguing India’s adoption regulation body the Central Adoption Resource Authority.</p> <p>ABOUT CARA:</p> <ul style="list-style-type: none"> • <u>Statutory body of the Ministry of Women & Child Development, Government of India.</u> • Designated as the <u>Central Authority for inter-country adoptions under the Hague Convention on Inter-country Adoption, 1993 (ratified by India in 2003).</u> • <u>Regulates the adoption of orphaned, surrendered, and abandoned children in India.</u> • Monitors and regulates various bodies including State Adoption Resource Agency (SARA), Specialised Adoption Agency (SAA), Authorised Foreign Adoption Agency (AFAA), Child Welfare Committees (CWCs), and District Child Protective Units (DPU)s). • Mandatory registration of Child Care Institutions (CCIs) linked to CARA under the Juvenile Justice (Care and Protection of Children) Act, 2015. <div data-bbox="1034 533 1469 1099" style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>HAGUE CONVENTION ON INTER-COUNTRY ADOPTION:</p> <ul style="list-style-type: none"> ○ Provides safeguards for children and families involved in adoptions between participating countries. ○ Aims to prevent the abduction, sale, or trafficking of children. ○ Establishes minimum standards without serving as a uniform law of adoption. </div>
<p>NEST INITIATIVE</p>	<p>WHY IN NEWS? Indian Green Building Council (IGBC) launched a rating and certification initiative called ‘Nest’.</p> <p>NEST Initiative:</p> <ul style="list-style-type: none"> ▪ Aims to promote sustainable and eco-friendly constructions in domestic housing. ▪ Encourages homeowners and the residential sector to adopt green building features. ▪ Focuses on reducing electricity consumption, water usage, and creating a healthy living space. <p>Indian Green Building Council (IGBC):</p> <ul style="list-style-type: none"> ▪ Established in 2001 as part of the Confederation of Indian Industry (CII). ▪ Premier certification body for green buildings in India. ▪ Offers various services, including developing green building rating programs and certification services. ▪ Hosts the annual Green Building Congress, a flagship event on green buildings. ▪ Among the five countries on the board of the World Green Building Council. ▪ Headquarters located in Hyderabad.



**KEY FINDINGS ON
GLOBAL EMPLOYMENT IN
ENERGY SECTOR (2022)**

- Ratings based on six environmental categories: sustainable station facility, health, hygiene and sanitation, energy efficiency, water efficiency, smart and green initiatives, and innovation and development.

Global Energy Sector Employment (2022):

- Worldwide employment in the energy sector increased by 3.4 million to reach 67 million in 2022.
- Clean energy industries contributed significantly, adding 4.7 million jobs globally and totalling 35 million.
- Fossil fuel employment, slower to recover after 2020 layoffs, remains approximately 1.3 million below pre-pandemic levels at 32 million.
- In India, job growth in both clean energy and fossil fuel sectors remained positive compared to pre-pandemic levels in 2019.
- India witnessed the fourth-highest number of new clean energy jobs created in the last three years.
- The report identified five key energy sectors driving post-pandemic job creation: solar PV, wind, electric vehicles (EVs) and battery manufacturing, heat pumps, and critical minerals mining.
- These sectors collectively employed around 9 million workers, with solar PV leading with approximately 4 million jobs.
- Notably, the manufacturing of EVs and their batteries emerged as the primary source of growth.

COSMIC VINE

WHY IN THE NEWS? The Cosmic Vine came into focus through analysis of data gathered by the James Webb Space Telescope (JWST), recognized as humanity's most potent tool for exploring the depths of space and time.

ABOUT COSMIC VINE:

- Identified as an extensive "vine-like structure," the Cosmic Vine envelops 20 galaxies and spans over 13 light years.
- Positioned in the early universe, researchers determined its age with a redshift of 3.44, signifying a travel time for light between 11 and 12 billion years before reaching JWST.
- Houses two of the most massive galaxies at this high redshift—Galaxy A and Galaxy E, both exhibiting reduced star formation rates in a quiescent state.
- Scientists speculate that the Vine might act as a precursor to a galaxy cluster, providing valuable insights into the development of such clusters and the emergence of massive galaxies within them.

WHAT IS A LIGHT YEAR?

- A light-year, measuring distance rather than time, represents the distance travelled by a beam of light in a single Earth year.
- This measurement equates to approximately 6 trillion miles (9.7 trillion kilometers), serving as a unit to gauge the vast distances in space.