



Learning the Earth with Artificial Intelligence & Physics (LEAP)

Bylaws

Roles and Responsibilities of the Directors

Center Director

The Director is responsible for the successful execution of all components of the LEAP Strategic Plan. As the PI, the Director is responsible for developing relationships and for communicating with NSF staff. The Director supervises corporate relationships, in coordination with the Corporate Engagement Director. The Director acts as the supervisor for the Managing Director. The Director also serves as joint Deputy Equity Officer. The Director ensures integration and synergy of Knowledge Transfer with the Education and Research components of LEAP, having a seat in both subcommittees. The Director is the liaison with the External Advisory Board and Director's Council. Final decision-making authority, reporting, and legal responsibility, including for the budget, rest with the Director. The Director is also responsible for NSF Site Visits and Annual Progress Reports.

Deputy Center Director

The Deputy Director oversees LEAP research, its activities, and annual research priorities. The Deputy Director oversees integration of LEAP research into the Community Earth System Model and is the Center's liaison to National Center for Atmospheric Research leadership. The Deputy Director also works with GISS to promote interoperability of LEAP outputs with ModelE. The Deputy Director manages the annual Request for Proposal (RFP) and associated reporting, coordinates research seminars and research activities, and plans the Annual Meeting. The Deputy Director oversees the integration of research with education with the Chief Convergence Officer and Education Director.

Joint Deputy Center Director and Director Responsibilities

The Director and Deputy Director plan the annual budget strategy together, define the Strategic Planning process and key strategic orientations/decisions, and are responsible for conflict resolution.

Managing Director

The Managing Director supports the Center Director, Deputy Director, and the Executive Committee. They delegate to, supervise, and manage other staff (Assistant Director of Education Programs, Manager of Communications and Knowledge Transfer, and Manager of Finance and Operations), and LEAP's physical office space at the Columbia Innovation Hub. They lead and manage daily Center operations, communications, events, and Site Visits. They are responsible for administrative coordination with all Columbia units and with partner institutions. They supervise the budget. They administer the annual internal Call for Proposal funding (RFP process), facilitate recruitment of scientists, and the integration of partners' institutions, and corporate partners. They oversee outreach and communication, and represent the Center at meetings, conferences, symposia, and other events.



Chief Convergence Officer & Education Director

The Chief Convergence Officer & Education Director oversees all educational programs and ensures the execution of all evaluation activities. The Chief Convergence Officer & Education Director oversees integration of research with education with the Deputy Center Director. They co-supervise the equitable and training of climate data scientists with the Chief Equity Officer & Knowledge Transfer Director.

Data and Computation Director

The Data and Computation Director develops LEAP-Pangeo and ensures its effectiveness for supporting research, education and knowledge transfer, for both the public and corporate partners. The Data and Computation Director oversees the development and operations of the data infrastructure (LEAPangeo).

Chief Equity Officer & Knowledge Transfer Director

The Chief Equity Officer & Knowledge Transfer Director ensures that diversity, equity and inclusion are taken into account in all LEAP activities. They oversee DEI assessment with respect to recruiting activities, as well as LEAP staff training. The Chief Equity Officer & Knowledge Transfer Director co-supervises the equitable and training of climate data scientists with the Chief Convergence Officer & Education Director. The Chief Equity Officer & Knowledge Transfer Director supervises the bidirectional knowledge transfer with public and private partners.

Institutional Integration Director

The Institutional Integration Director is responsible for representing the needs of non-Columbia institutional partners to the Executive Committee and ensuring their fair representation in the center decision making process, as well as in the funding mechanism.

Model Development Director

The Model Development Director is responsible for coordinating the integration of LEAP algorithms into CESM and supporting their portability to other models, including NASA ModelE. They supervise the integration engineer at NCAR.

Geoscience Director

The Geoscience Director is responsible for supervising and assessing geoscience research ongoing in LEAP and identifying new research directions that can support LEAP objectives, and to present these to the CSC. Together with the Data Science Director, the Geoscience Director organizes and oversees the research working groups.

Data Science Director

The Data Science Director is responsible for supervising data science research ongoing in LEAP and identifying new research directions that can support LEAP objectives, and to present these to the CSC. Together with the Geoscience Director, the Data Science Director organizes and oversees the research working groups.

Corporate Engagement Director

The Corporate Engagement Director is responsible for engaging corporate partners to understand their needs in the climate data science spectrum, from more research oriented to more knowledge transfer oriented, defining and reevaluating key partners across the years, and



working with LEAP to meet these needs. The Corporate Engagement Director coordinates engagement with the Center Director.

Public Engagement Director

The Public Engagement Director is responsible for planning and implementing activities in outreach communication to the general public.

Committee Membership and Responsibilities

In the event a Committee or Subcommittee member with voting privileges ceases their membership, it is the responsibility of that Committee or Subcommittee to determine whether the stated responsibilities and decision-making authority of that body can still be achieved, and, if not, to discuss and determine a suitable replacement via consensus. Appendix A contains a record of Committee and Subcommittee changes.

Executive Committee (EC)

The EC will be comprised of 12 members: Director (Chair), Deputy Director, Chief Convergence Officer & Education Director, Data and Computation Director, Chief Equity Officer & Knowledge Transfer Director, Institutional Integration Director, Model Development Liaison, Geoscience Director, Data Science Director, Corporate Engagement Director, Public Engagement Director, and Managing Director. All 12 members have voting privileges.

The EC is LEAP's principal forum for strategic and operational decision-making.

EC responsibilities and decision-making authority are to

- Continually review research, education, DEI, and KT progress toward strategic goals
- Develop and annually review the LEAP Strategic Plan
- Review internal funding recommendations from CSC for DEI and institutional balance
- Review the annual budget (past year and projected), based on an overview by Center Director
- Plan Annual Meeting and workshops
- Steward existing and forge new institutional partnerships
- Resolve internal conflicts
- Support the hiring of staff

A voting quorum will be seven and majority votes with a quorum will be decisive.

Convergence Subcommittee (CSC)

The CSC will include seven members: Deputy Director (co-Chair), Chief Convergence Officer & Education Director (co-Chair), Data and Computation Director, Institutional Integration Director, Model Development Liaison, Geoscience Director, and Data Science Director. The Director is an ex-officio member with voting privileges. The CSC is staffed by the Assistant Director of Education Programs.

The CSC is LEAP's principal forum for implementing research and education activities of LEAP.

CSC responsibilities and decision-making authority are to

- Establish metrics for research and education progress



- Oversee internal proposals for research
 - Determine annual research priorities, and formulate internal RFP
 - Establish LEAP Funding Review Panel (LFRP) to review proposals
 - Review and vote on LFRP funding recommendations
 - Present LFRP funding recommendations to EC for final approval
 - Determine whether existing projects should be expired and its resources redistributed*
- Review research progress against metrics
- Review education progress against metrics
- Support integration of LEAP research outputs into CESM
- Ensure integration of research and education
- Select LEAP Fellows
- Report to the EC biweekly
- Review LEAP-Pangeo progress and data infrastructure against the needs of research, education and corporate partnerships

A voting quorum will be five and majority votes with a quorum will be decisive. Members must be present to vote.

**Projects will expire depending upon NSF feedback, inappropriate progress after a first warning, waning faculty or trainee interest, emergence of new projects that more directly align with LEAP's Knowledge-Data Continuum, and/or improper productivity.*

Knowledge Transfer Subcommittee (KTSC)

The KTSC includes four members from the LEAP EC: Chief Equity Officer & Knowledge Transfer Director (Chair), Center Director and Deputy Equity Officer, Corporate Engagement Director, and Public Engagement Director. In addition, five corporate and public partners will be members. LEAP's Education Evaluator and a representative of Teacher's College, one of LEAP's subawardees, are members without voting privileges. The KTSC is staffed by the Manager of Communications and Knowledge Transfer.

The KTSC is the principal forum for implementing diversity, equity and inclusion and knowledge transfer activities of LEAP.

KTSC responsibilities and decision-making authority are to

- Establish metrics for diversity, equity and inclusion
- Establish metrics for knowledge transfer
- Review progress against DEI and KT metrics
- Plan DEI Workshops, Hackathon, Translate-a-thon
- Manage corporate and public engagement
- Anonymize applications for staff positions and for selection of LEAP Fellows
- Govern the Storytellers in Residence program
- Report to the EC monthly
- Planning monthly Convergence Luncheons

A voting quorum will be three and majority votes with a quorum will be decisive. Members must be present to vote.



Panels

LEAP Funding Review Panel (LFRP) will be selected annually by the CSC. It will comprise one CSC member (co-chair), one KTSC member, two geoscientists from the LEAP team, two data scientists from the LEAP team, one postdoctoral fellow, and one PhD student.

External Committees

External Advisory Board

Membership:

1. Prof. Melissa Burt - Colorado State University
2. Prof. Amy McGovern - Oklahoma University
3. Prof. Rosalynn Vasquez - Boston University
4. Prof. Sonia Seneviratne - ETH Zurich
5. Prof. Rafael Bras - Georgia Tech
6. Prof. Bin Yu - UC Berkeley
7. Prof. Montserrat Fuentes - St Edward's University
8. Prof. Rebecca Nugent - Carnegie Mellon University

Staffed by: Managing Director

Responsibilities:

- Advising on strategic partnership formation
- Advising on the external competitive environment
- Advising on complementary NSF grants to bolster its broader

Meeting Frequency: Annually

Meeting Duration: Two to three hours

Director's Council

Membership:

1. Dean Shih-Fu Chang, Columbia Engineering
2. Vice Dean Garud Iyengar, Columbia Engineering
3. Dean Maureen Raymo, Columbia Climate School
4. Dean Alexander Halliday, Columbia Climate School
5. Dean Costis Maglaras, Columbia Business School
6. Dean Melissa Begg, Columbia School of Social Work
7. Dean Amy Hungerford, Executive Vice President for Arts and Sciences and Dean of the Faculty of Arts and Sciences, Columbia
8. Dean James Bullock, School of Physical Sciences, UC Irvine
9. Dean Russel Caflisch, Director, Courant Institute of Mathematical Sciences, NYU
10. *Vacant*, NCAR

Center Director and Center Deputy Director are ex-officio members



Staffed by: Managing Director

Responsibilities:

- Reviewing preliminary draft of Annual Progress Reports and providing feedback for improvement
- Providing administrative guidance
- Supporting continuous and streamlined inter-institutional integration

Meeting Frequency: Annually

Meeting Duration: One hour

Changing of Directors

Center Director Succession - If the Center Director steps down, the Deputy Director will become Director. If neither can serve, the EC will elect a six-month Interim Director, and in the meantime, will conduct a search. At the end of the six months, the EC will vote to determine the permanent Center Director.

Other Directors - If a Director other than the Center Director leaves their role, the EC will be responsible for identifying a replacement, and providing the results of their vote to the Center Director. The Center Director will make the final decision on the appointment.

Staff Roles and Responsibilities, Reporting

Staff ensures that research, educational, broadening participation, and knowledge transfer initiatives have proper operational support. All staff members are currently supporting/assisting the Center's activities and efforts. Staff members will be included in relevant parts of the decision-making process.

Managing Director

- Reports to: Center Director
- Role and Responsibilities: The Managing Director supports the Center Director, Deputy Director, and the Executive Committee. They delegate to, supervise, and manage other staff (Assistant Director of Education Programs, Manager of Communications and Knowledge Transfer, and Manager of Finance and Operations), and LEAP's physical office space at the Columbia Innovation Hub. They lead and manage daily Center operations, communications, events, and Site Visits. They are responsible for administrative coordination with all Columbia units and with partner institutions. They supervise the budget. They administer the annual internal Call for Proposal funding (RFP process), facilitate recruitment of scientists, and the integration of partners' institutions, and corporate partners. They oversee outreach and communication, and represent the Center at meetings, conferences, symposia, and other events.

Integration Engineer

- Reports to: Center Deputy Director



- Role and Responsibilities: The Integration Engineer supports the development and integration of machine learning algorithms and their implementation in the Community Earth System Model (CESM). They provide software engineering support to aid implementation of new science, maintenance of testing frameworks, and development of new infrastructure in the CESM. They are in residence at NCAR.

Manager of Communications and Knowledge Transfer

- Reports to: Managing Director
- Role and Responsibilities: The Manager of Communications and Knowledge Transfer supports knowledge transfer programming linking academia with external stakeholders. They also manage the Center's website and social media platforms, author publications and opinion pieces, author content targeting corporate, non-profit, and public audiences, author a monthly newsletter, publish articles across owned and earned media outlets, supervise communications vendors, and stewards and establishes external partnerships with industry, state, local governments, and NGOs.

Assistant Director of Education Programs

- Reports to: Managing Director
- Role and Responsibilities: The Assistant Director of Education Programs supports LEAP's educational programs for faculty, graduate, undergraduate, K-12, teacher, and parent trainees. They also facilitate rotation of LEAP Fellows to NCAR. They provide administrative support to the Convergence Subcommittee.

Manager of Finance and Operations

- Reports to: Managing Director
- Role and Responsibilities: The Manager of Finance and Operations serves as LEAP's financial, accounting, procurement, subaward, and HR specialist and manages daily financial operations. They are also responsible for trainee hiring and payroll.

Appendix A

Date	Committee or Subcommittee Name	Change	Outcome
October 2022	Convergence Subcommittee	Ryan Abernathy, Data and Computation Director, is no longer a participating member as of October 2022.	The Convergence Subcommittee voted on November 10, 2022 that the stated responsibilities, work, and decision-making authority of the subcommittee can be achieved without filling Ryan Abernathy's position.