

# **Perspective on Magnetic Fusion Energy Directions from Early Career Fusion Scientists**

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# Motivation for this effort arose from discussions at the 2017 Madison Workshop

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- Observed low participation by early career fusion scientists (ECFS) at the Madison workshop
- Group of ECFS members self-organized to spur participation by ECFS community as a whole in the strategic planning process, and to provide a platform for gathering ECFS input to the NAS panel
- We define ECFS as those who are currently working on magnetic fusion energy in the US, and received their Ph.D. within the last ~15 years
  - i.e. Those who received their degree after 2002 Snowmass meeting
- Because many of us within the ECFS community plan to remain in fusion research, and some of us will likely be responsible for leading the program in the future, we believe it is vital for our community to be engaged and providing input into the strategic planning process now

# A private online forum was used to facilitate discussion amongst the ECFS community

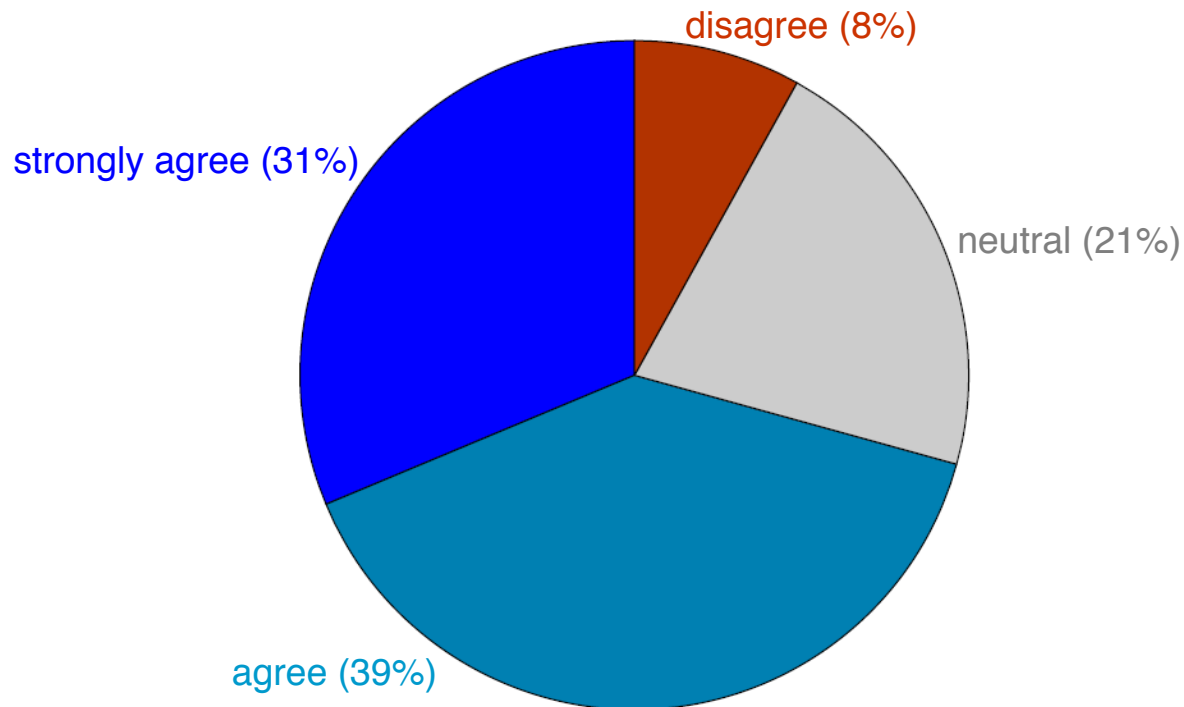
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- Initial organizing group formed at 2017 APS-DPP meeting
  - Approximately 200 researchers who satisfied ECFS criteria were identified and invited to join forum
  - 146 members registered
- Primary means of data gathering and discussion organization was through a series of poll questions, with accompanying forum threads for each question
  - Questions chosen by organizers, using input from themselves and suggestions from forum participants
- Four rounds of polls with a total of approximately 30 questions
  - Typically between 65-85 responses per question

Underlying theme of ECFS discussions was the lack of urgency in the current program, and the need for a more vigorous research program to develop economical fusion energy within the next several decades

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- Our primary motivation for participating in MFE research is the goal of a fusion power plant [91/1], and timely progress towards fusion energy is a necessary condition for keeping us in the field [70/8]



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- Our primary motivation for participating in MFE research is the goal of a fusion power plant [91/1], and timely progress towards fusion energy is a necessary condition for keeping us in the field [70/8]
- The 30-year vision for the US program should be to develop the science and technology basis needed to simulated sufficient industry involvement to bring fusion to market [81/6]
- Access to a burning plasma should be a major focus of the US fusion program [90/6]
- High temperature superconductor (HTS) development should be an immediate high-priority element of a US strategic plan [84/3]
- A new major domestic facility is a necessary component of a US strategic plan [88/4]
  - A redistribution of current funding is expected to support such a facility [73/11], and that reduced funding for current user facilities is acceptable to fund this facility [71/13]

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**Please see the submitted whitepaper for ECFS responses on all ~30 questions**

- Discussion spans wide range of topics including strategic planning and prioritization with a diversity of levels of consensus

**We'd be happy to discuss and answer any questions the committee may have**

# Going Forward

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- Perhaps more importantly than any single poll result, we believe this process has demonstrated that the ECFS community
  - Has an appetite and willingness to be actively engaged in the planning process
  - Is able to work together constructively to build a common vision for the fusion program
- We look forward to working with OFES and institutional management to continue contributing to the strategic planning process
  - Question for the panel- how can we best continue contributing?
- Please see our whitepaper for more details of our discussions  
[http://sites.nationalacademies.org/cs/groups/bpaside/documents/webpage/bpa\\_184875.pdf](http://sites.nationalacademies.org/cs/groups/bpaside/documents/webpage/bpa_184875.pdf)