NSF CHE Disciplinary Research Programs

Chemical Synthesis (SYN)

The making and breaking of chemical bonds is central to the development of new compounds and materials that improve the human condition – This aligns with the NSF mission.

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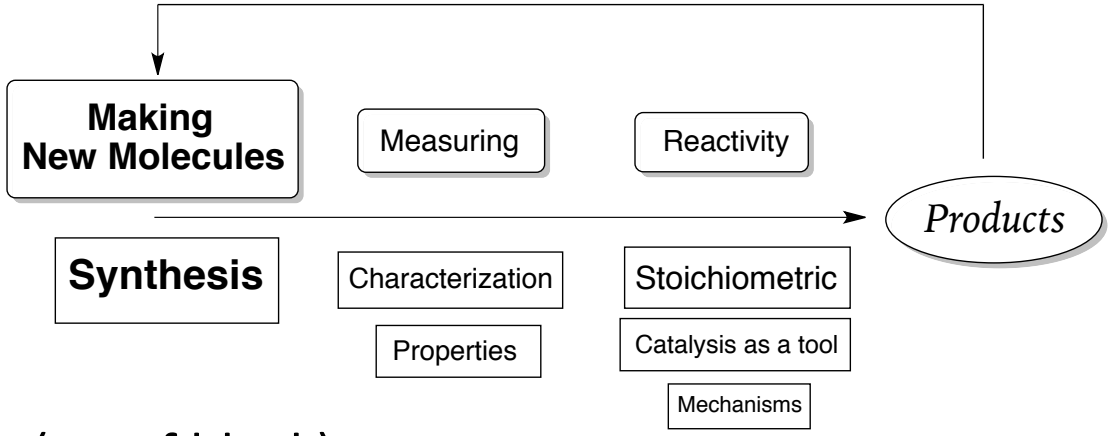
The Chemical Synthesis (SYN) Program

- Supports **experimental and computational** research on the development of new and efficient synthetic methodologies and on the synthesis of **complex and/or challenging chemical structures**

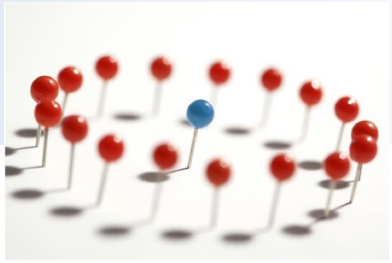


- Organic synthetic methods
- Target-directed synthesis/ Molecular editing
- Pericyclic reactions and annulation chemistry
- Photoredox/organocatalysts
- Transition metal-mediated synthesis

- Main group (s, p, f block)
- Transition metal (d block) coordination and biomimetic chemistry
- Synthetic methodology (thermal, photo/electrochemical, mechano, etc.)
- Experimental validation of bonding descriptions

Sustainability in Chemistry: Areas of interest include: Developing processes with sustainable replacements or substantial reduction of rare, expensive, and/or toxic chemicals, materials, and catalysts with earth-abundant, inexpensive, and benign equivalents; developing more sustainable synthetic methods and processes; etc. For full descriptions, see e.g., NSF 22-111 and NSF 23-157

SYN Program: Recent Panel Organization



Organic Synthetic Methods

Total synthesis

Biomolecules

Cycloadditions

Photoredox

Organocatalysis

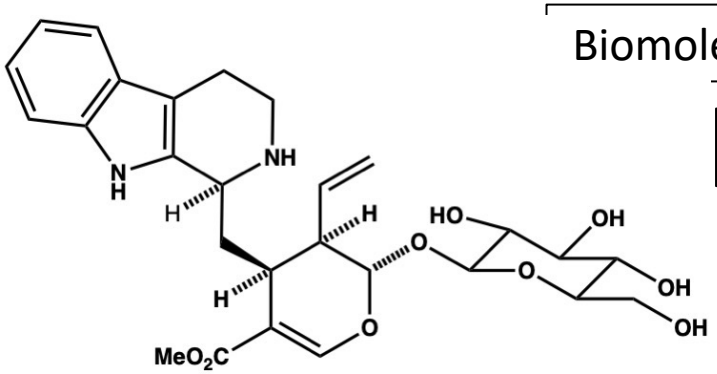
Organometallics

Organic products | *Metal-centered*

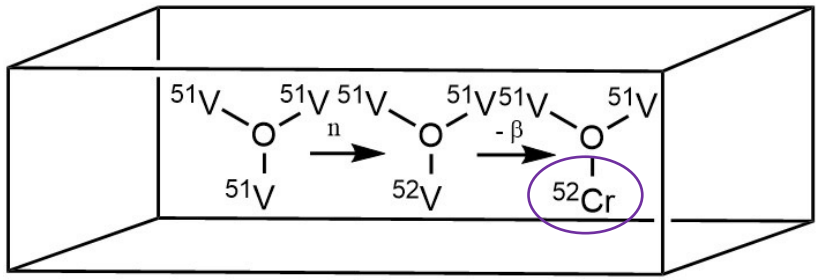
Main group (s/p) and f-block

Transition metal (d-block)

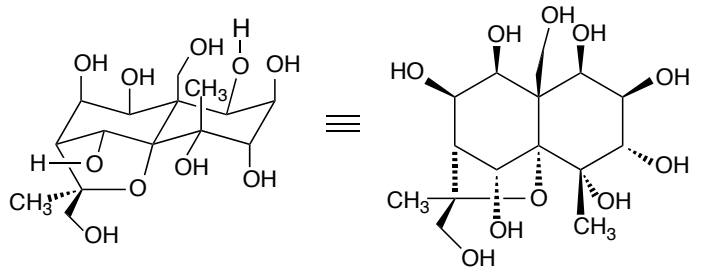
Coordination | *Biomimetic*



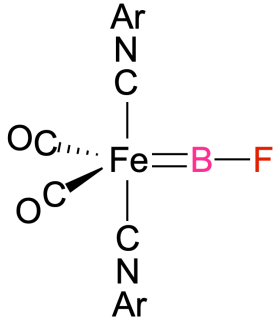
Strychtosidine: Garg CHE-1900178



Nuclear transmutation in porous polymers
Zhang & Heiden EAGER CHE-2324984



Euonyminol: Herzon CHE-1954319 & CREX

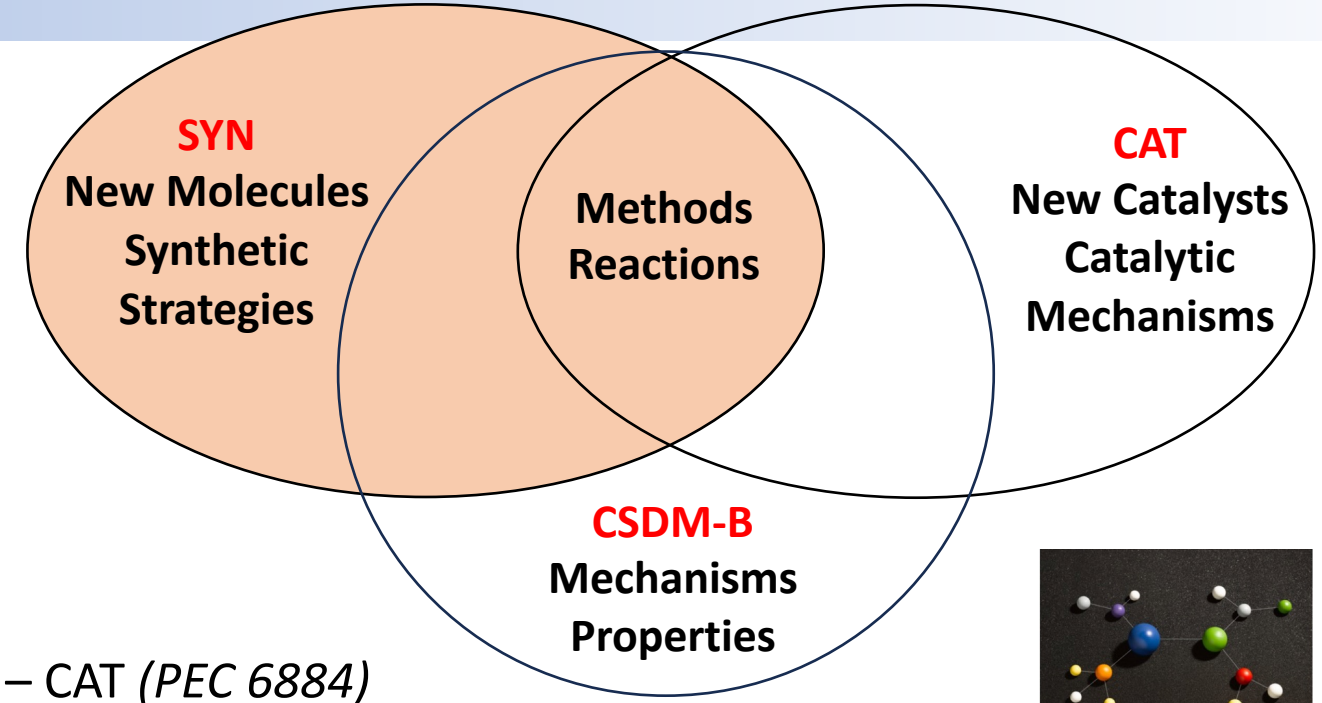


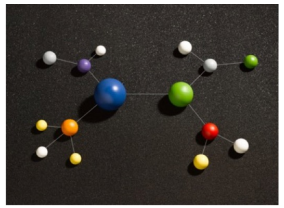
Figueroa CHE-1802646

The Chemical Synthesis (SYN) Program

The SYN Program interacts closely with the CAT and CSDM-B Programs, as well as other programs within and outside of CHE

(SYN Program Element Code = 6878)





<u>If the main objective of the proposal is to:</u>

- Design new catalysts and study catalytic reactions – CAT *(PEC 6884)*
- Study the mechanisms/properties/function of target systems – CSDM-B *(PEC 9102)*
- Develop novel synthetic approaches to macromolecular, supramolecular or nanoscale chemical structures – PIs should consider MSN
- Develop syntheses of extended solids – Consider NSF ENG Division of Materials Research (DMR/SSMC)

<u>Which Program is the best "home" for your proposal?</u>

- Consult the SYN Program synopsis at https://beta.nsf.gov/funding/opportunities/chemical-synthesis-syn-0
- Consult the NSF Awards Search Database (can browse project titles and abstracts) – *can use PECs*
- If still unsure, you can list >1 program (e.g., SYN and CAT) during proposal submission stage

NSF Merit Review Criteria – additional info on BI

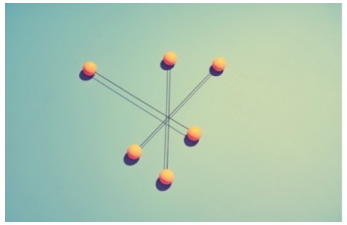
*NSF is very transparent with the **Merit Review Criteria (IM & BI)** – see the PAPPG Chpt IIIA-B for details*

From the main NSF Chemistry webpage

Popular Links

- Career Opportunities
- CHE Broader Impacts Resources
- Division of Chemistry's Office Hours
- Quantum Information Science and Engineering Research at NSF
- CHE Panelist Travel Information and Instructions
- Become a Reviewer for NSF CHE
- Chemistry Highlights
- Newsletters and Workshops
- Chemistry Blogs on Tumblr

See All Additional Resources ›



CHE Broader Impacts Resources

Useful NSF Weblinks for Broader Impacts (BI):

The NSF Proposal and Award Policies & Procedures Guide (PAPPG) defines the scope of the BI criterion for proposals. As noted in the PAPPG Chapter II.D.2.d.(i), "Broader Impacts may be accomplished through the research itself, through the activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to the project. NSF values the advancement of scientific knowledge and activities that contribute to the achievement of societally relevant outcomes that include (but are not limited to): full participation of women, persons with disabilities, and underrepresented minorities in STEM; increased public scientific literacy and public engagement with science and technology; development of a diverse, globally competitive STEM workforce; and increased partnerships between academia, industry, and others." See the PAPPG link above for more information.

NSF Broader Impacts: This NSF webpage provides information on items such as (i) What are broader impacts?, (ii) Why does NSF focus on broader impacts?, and (iii) How does NSF evaluate a proposal's broader impacts? This webpage also provides links to other NSF resources on the topic and includes a helpful 3-minute video on NSF's broader impacts merit review criterion.

Perspective on Broader Impacts: This document is an outcome of the Broader Impacts Infrastructure Summit in 2014, involving over 120 professionals from 80 institutions of higher education and nonprofits, and includes NSF's perspectives on the topic.

NSF 101: Five tips for your Broader Impacts statement: This website contains useful tips from NSF program officers.

Recent CHE Office Hour on Broader Impacts: This PPT slide deck represents our July 2021 CHE Office Hour on various BI topics.

Writing a Competitive NSF Proposal; Prior to Submission

- *Do you have an idea for a proposal?*
- Make use of "Search Awards" (search by keywords) to locate abstracts of proposals with comparable objectives. Find Directorates/Divisions/ Programs funding similar work. Read the updated program descriptions and reverse search
  https://www.nsf.gov/awardsearch/advancedSearch.jsp
- **Contact the Program Director** (well in advance) to determine if your project is appropriate; aim for 4-6 months in advance
  - Draft a 1-2 white paper, email it to the PD with a request to discuss
- NSF has many online resources for *Writing Proposals*; E.g., go to nsf.gov and search "writing a proposal". *Pay attention to the Merit Review Criteria!*
- Pay attention to Dear Colleague Letters and solicitations about funding opportunities. Follow instructions! Proposal & Award Policies and Procedures Guide https://new.nsf.gov/policies/pappg/24-1 and any special requirements in solicitations. E.g.,

  GOALI: Grant opportunities for academic liaison with industry

  EAGER: Early-concept grants for exploratory research

Supplements to Existing Awards

Once funded, look for opportunities for supplemental funding that expand the opportunities of your project. Examples,

INTERN (NSF 21-013): Supplements support non-academic research internships for graduate students

MPS-AGEP-GRS (NSF 20-083): Supplements support additional graduate researchers to broaden participation by members of underrepresented groups. AGEP-eligible institutions here.

FASED (PAPPG Part I Chapter II.F.7): Supports persons with physical disabilities by providing special equipment and assistance under NSF awards. Also **PWD-SEA** (NSF 21-110)

MPS-GRSV (NSF 23-161): Graduate Research Supplement for Veterans

MPS-HIGH (NSF 22-041): To broaden participation of high school students with emphasis on URMs.

CHE-International Supplements (NSF 22-070): To add a new, or strengthen an existing, international dimension of an award

Career-Life Balance (see the PAPPG): to help researchers (faculty/postdocs/GRFPs), confronted with a short-term increase in dependent care responsibilities, ensure that the NSF-supported research can continue.

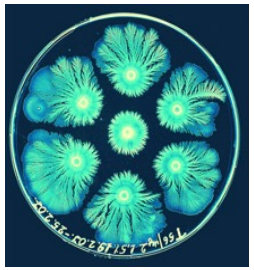
Research Experience for Teachers (in NSF 23-601): Enables K-12 science educators to participate in NSF research projects.

Research Opportunity Award (NSF 14-579): Support for faculty at RUI-eligible institutions to pursue research at visiting scientists with NSF-supported investigators at other institutions.

NSF Award Database Search – Advanced Search

Element Codes

SYN = 6878
CAT = 6884
CSDM-B = 9102



Overview of Award Search Features

Awardee Information

- Principal Investigator First Name
- Principal Investigator Last Name
- Include Co-Principal Investigator in name search
- Organization
- State: Select one
- Zip Code
- Country: Select one

Program Information

- NSF Organization: Select one
- Element Code — Any / All
- Reference Code — Any / All

HINT: The "Program" box searches both program element and program reference names and codes.

- Program
- Program Officer

Additional Information

- Keyword

HINT: The Keyword field searches on the title and abstract only.

- Search Award Title Only
- Award Number: Select one — From / To
- Award Amount: Select one
- Award Instrument: Select one

HINT: Data prior to 1976 may be less complete.

- Active Awards
- Expired Awards
- Original Award Date: Select one — From / To
- Start Date: Select one — From / To
- End Date: Select one — From / To

Search Reset

https://www.nsf.gov/awardsearch/advancedSearch.jsp

SYN Presence at Upcoming Conferences & Workshops

Conferences in Spring/Summer 2024

Gordon Research Conference on Metallocofactors: June 9-14, 2024, Stonehill College, MA

- *SYN representative* – George Richter-Addo

ACS Division of Organic Chem Graduate Research Symposium: July 25-28, 2024, Univ of Virginia in Charlottesville, VA

- *SYN representative* – Jon Rainier

Workshop on Synthetic Organic Chemistry: Summer 2024, Santa Barbara, CA

- *SYN representative* – Sarah Wengryniuk

ACS National Meeting: March 18-22, 2024. NSF CHE PDs from different programs (SYN, CAT, CLP, BP, MRI) will be at the NSF booth shared with GRFP.
[Also, Fall ACS Meeting in Denver, CO (Aug 18-22) and NOBCChE in Orlando, FL (Sept 30 – Oct 3)]

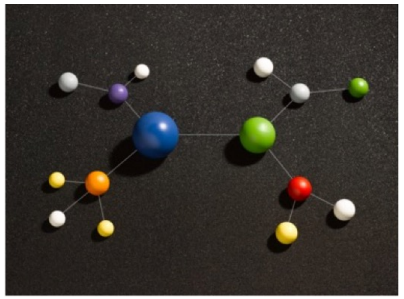
NSF/MPS-sponsored workshops for new faculty

Division of Chemistry: Early Career Investigator Workshop to be held in Alexandria, VA in May 2024. *Formal announcement coming soon!*

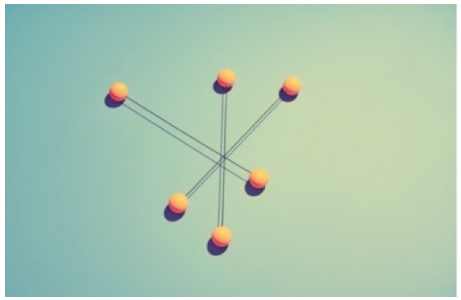
MPS Directorate-sponsored New Investigator Workshop to be held in Alexandria, VA on July 7-9, 2024. Details can be found here.

NSF CHE Disciplinary Research Programs

FYI: Upcoming Office Hours for Other Programs



CSDM-A – March 29, 2024
CAT – April 19, 2024
CSDM-B – May 10, 2024
MSN – August 16, 2024



Full listing of future and past meetings may be found here

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