



Bioethanol Science and Technology Center



ABTLus – maintaining a national laboratory



LNLS



CeBIME



CTBE is in very good company!

It is located at the Campus of ABTLus, where there are sophisticated labs, including, the **light synchrotron**, a Center of Molecular and Structural Biology (**CeBIME**) and the **Center of Nanotechnology Cesar Lattes (C2Nano)**

It is an investment of the federal government US\$ 30 million for the first three years

CTBE is **strongly based on science** and is intended to have the ability to attract at least US\$ 1 mi per year in scientific grants from FAPESP and other funding agencies for basic and applied science research

We want to be relatively small (max 50 scientists) with very good technicians and with excellent associations with national and international labs

Precision agriculture

Pilot Plant

Physics and
Chemistry

Microbiology and
Engineering
science

Theater

Cell Biology

Bioinformatics

Plant
Physiology and Molecular
Biology

Ecophysiology

Greenhouse



*7,000 m², with two floors, several labs and a pilot plant, CTBE wants to have, in one place a **transdisciplinary** institutions with national and international connections.*

The aim: *improve technologies for ethanol production*

Complex themes require inter and transdisciplinary approaches

BIOENERGY

The natural sciences: biology or life sciences, chemistry, earth sciences, mathematics and physics

The social sciences: anthropology, economics, political science, psychology, and sociology

The humanities: art and art history, history, philosophy, and religious studies;

The applied professions: business, communications, criminal justice, education, engineering, law, social work, and medicine.

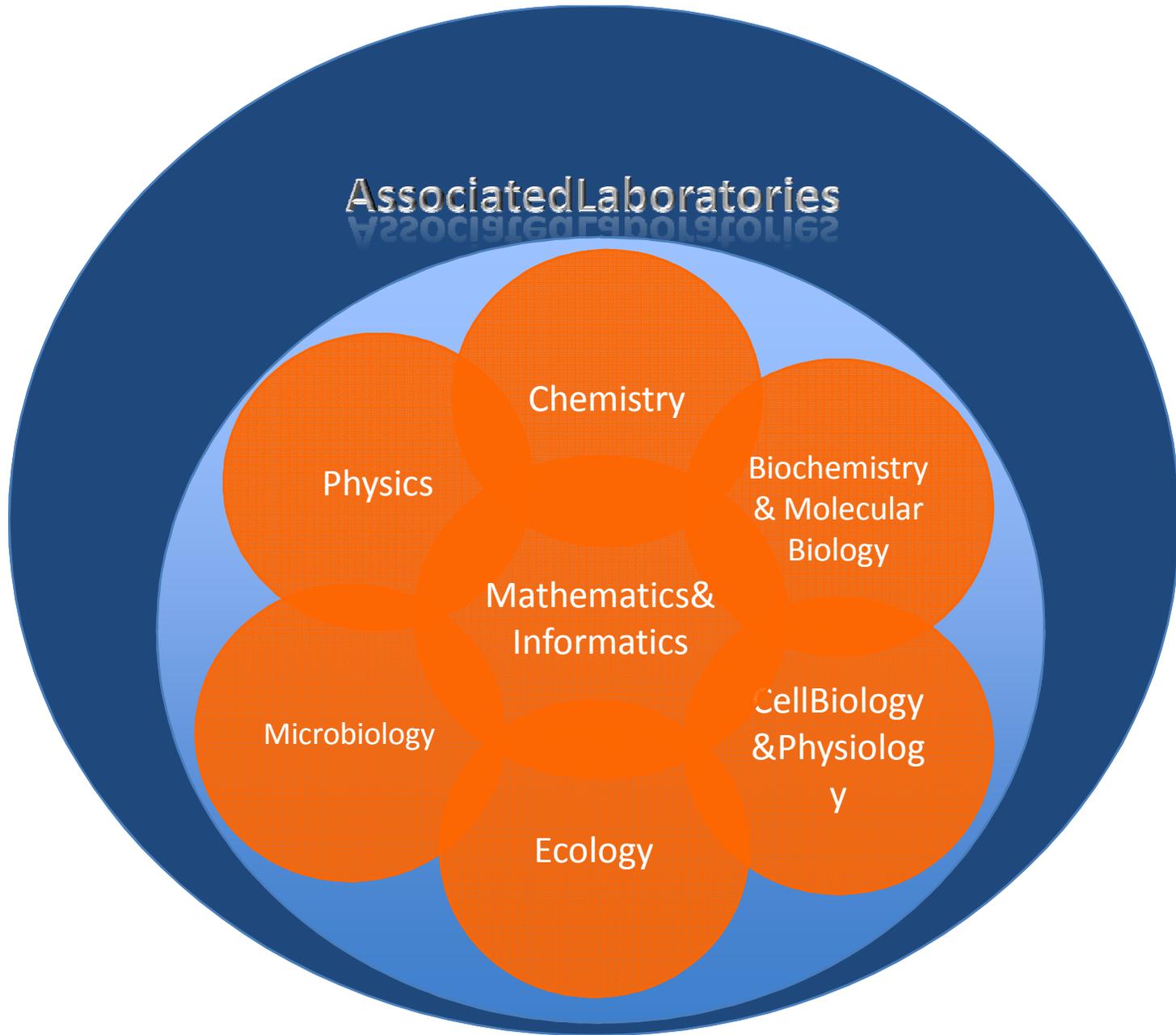
Inter X MultiXTransdisciplinary

Although denotations of these terms look similar to the layperson, one should not mix them:

Multidisciplinary: *disciplines run in parallel, WITHOUT interaction;*

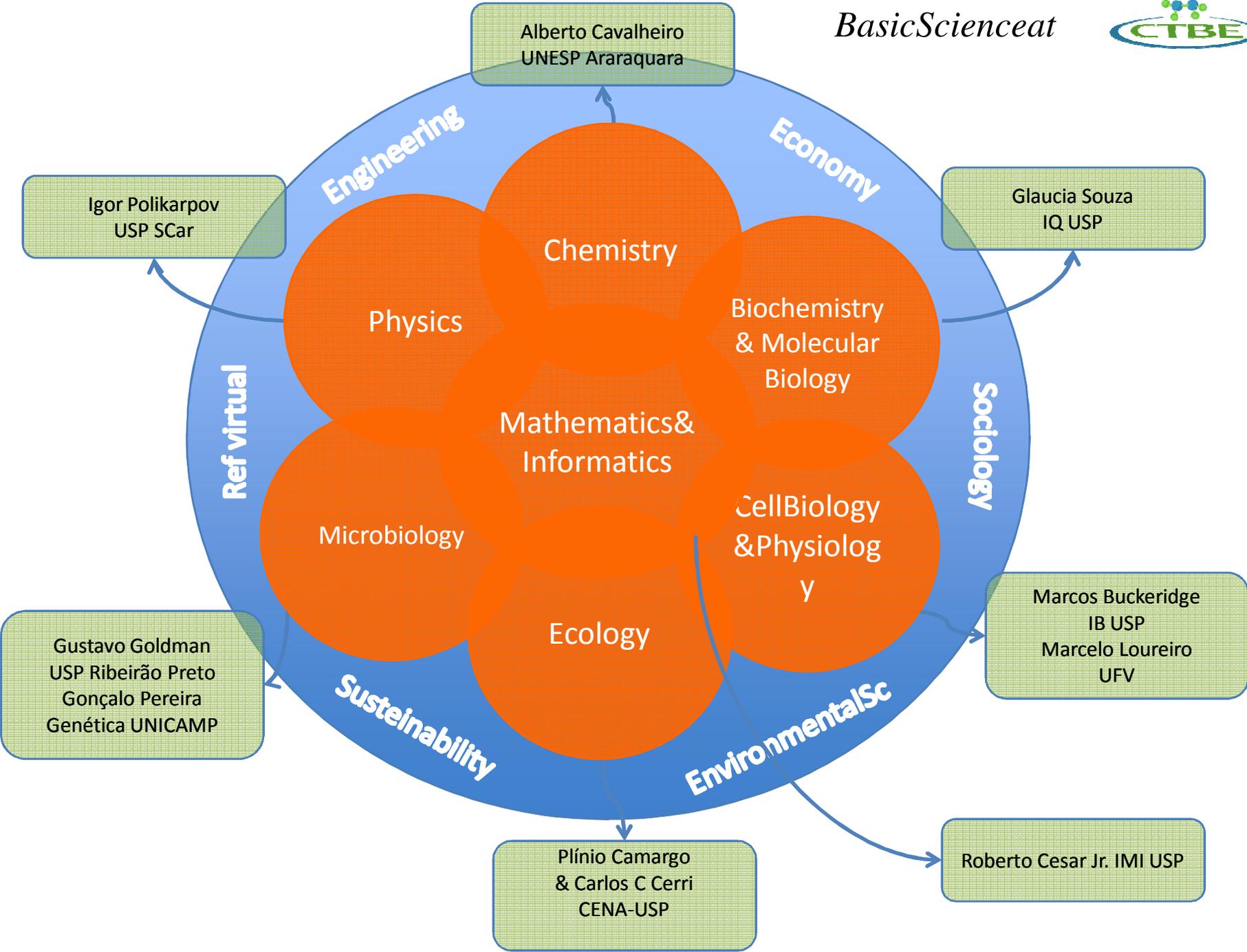
Interdisciplinary: *disciplines run in parallel, WITH interaction;*

Transdisciplinary: *interdisciplinary actions with the participation of society.*

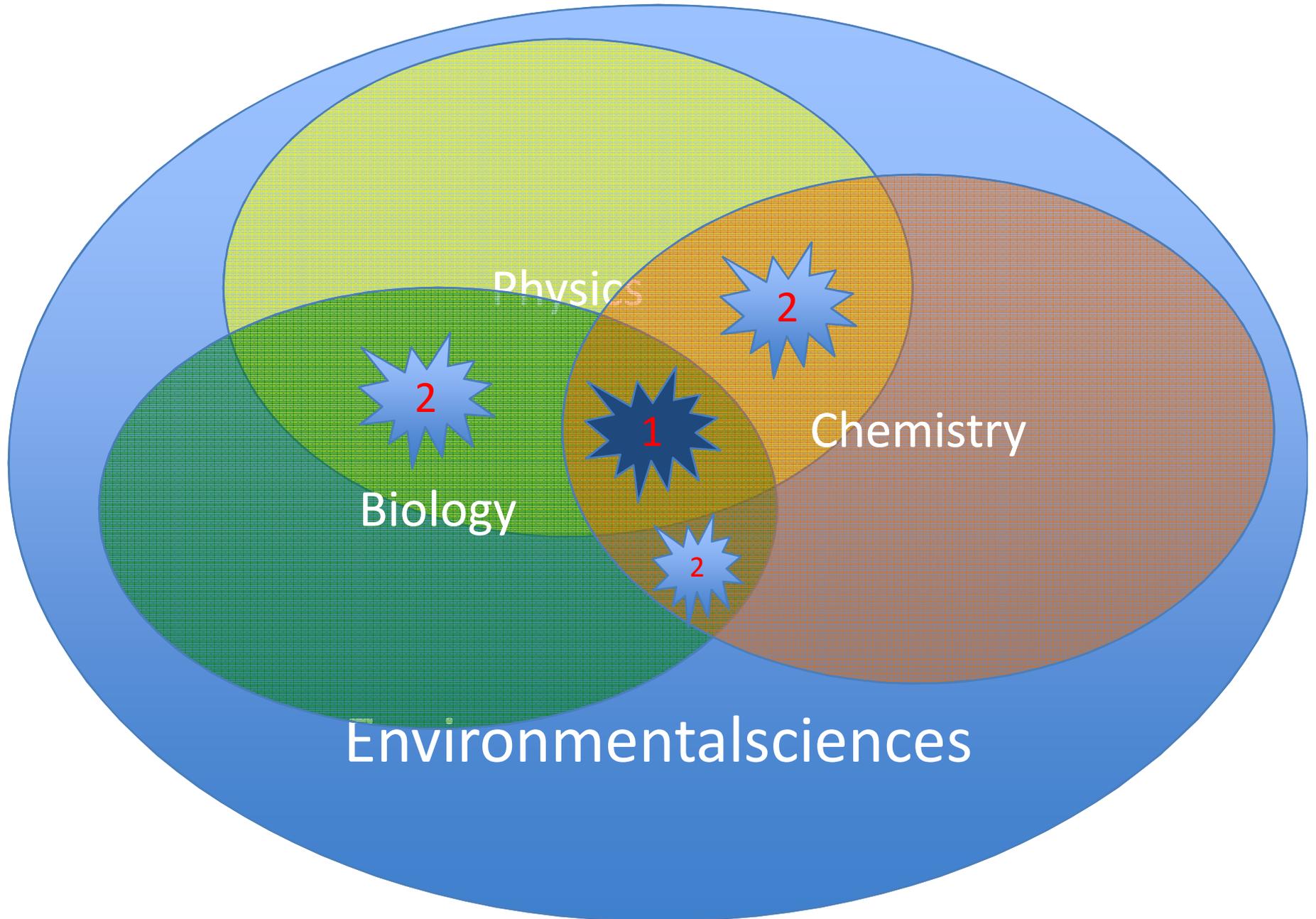


Interdisciplinarity at the





TRANSDISCIPLINARY APPROACH IN BIOFUELS RESEARCH



**SOCIOLOGY,
ECONOMY,
POLITICS**

Physics

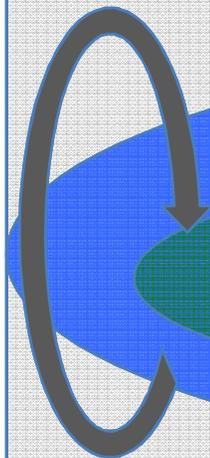
Biology

Chemistry

Environmentalsciences

ENGINEERING

**MATHEMATICS
& COMPUTING
SCIENCES**



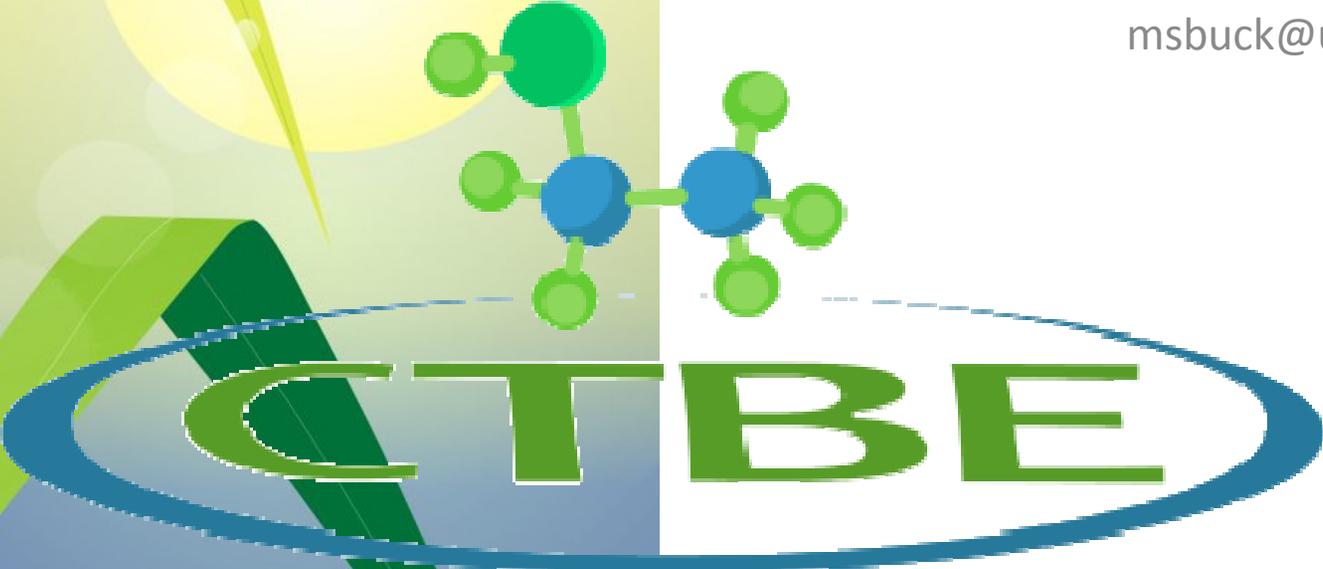
The evolution of Science

- For some authors, science has been altered at the heart of its paradigm:
 - 1) Science of the **Mode 1**: the normal science, as we know it;
 - 2) Science of the **Mode 2**: transdisciplinary or post-normal science

The Science of the Mode 2 is considered as the science oriented by society and therefore it is believed to be socially robust. The problem, though is that we will have to develop new methods to deal with it.

THANK YOU

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CTBE

INCT
BIOETANOL

The real-world research problems that scientists address rarely arise within orderly disciplinary categories, and neither do their solutions (Carole L. Palmer, 2001)