

Regional Innovation Policies and SMEs:  
Promoting technology transfer, Fostering Entrepreneurship, Nurturing Start-Ups to Support Regional Dynamics  
February 3 and 4, 2010 at Tokyo MFJ

# Regional Industry-Academy linkage and International cooperation: The role of ELyT-Lab. Joint Research Laboratory

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# Promotion of Internationalization

- Strong demand for Internationalization in all fields
  - Education
  - Research and Development
  - Social Services
  - Industry-Academy Collaboration
- Multi-Function of Internationalization
  - Foster of Human Resources
  - Promotion of Research
  - Feed-Back of Outcome to International Society
  - Various issues associated with International Industry-Academy Collaboration

# Promotion of Internationalization

- Education (For Example)
  - Global Standard
  - Students exchange and long-term stay
  - Double Degree and Joint Degree for Master degree and Ph D or equivalent
  - Research Internship for Undergraduates and/or PhD students
  - International Internship at Academy (Short stay for Open Eye and Long stay with Research Outcome)
  - International Internship at Industries( International Carrier Path Development for PhD students and also for Post Doctoral Researchers

# Promotion of Internationalization

- Research (For examples)
  - International Cooperative Research (Joint Research)
  - International Contract Research
  - International Cooperative Program
  - Promotion of Joint Research through Intellectual Properties
  - Exchange of Human Resources for Research and Development
  - Lack of Research Management Human Resources, especially in the area of International management
  - Lack of Research Coordination Human Resources, especially in the area of International Coordinator
  - Need of OJT under various International Research Collaboration

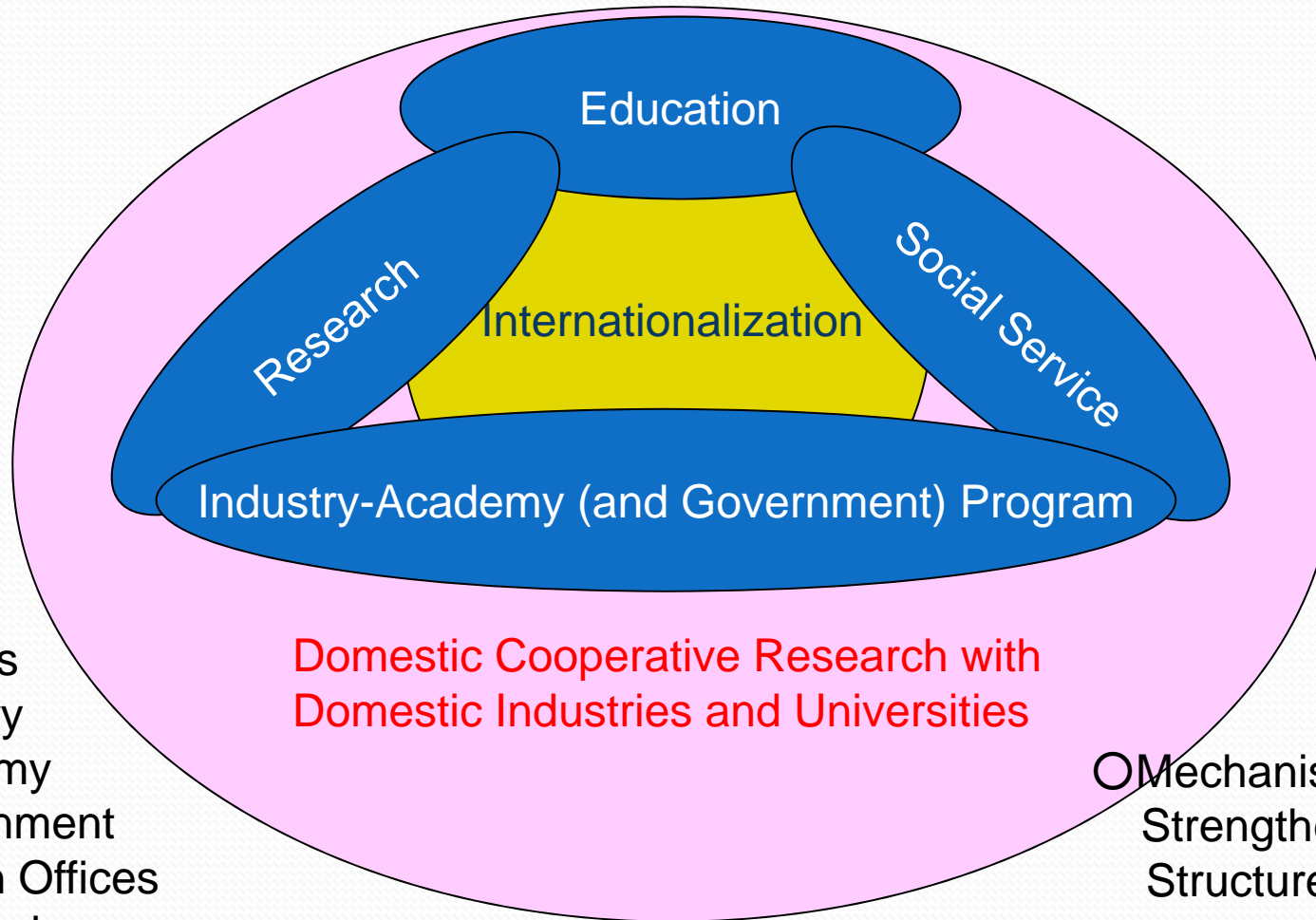
# Promotion of Internationalization

- Social Services (Examples)
  - Feed back of the outcome to Society
  - Feed back to International Society (Safety, Medical, Disaster Rescue etc)
  - International Industry-Academy and/or Industry-Academy-Government collaboration program
  - Lack of Specialized Human Resources in Handling of Intellectual Properties
  - Lack of Specialized Human Resources in Handling of International Contracts
  - Need OJT in International Collaborative Program

# Promotion of Internationalization

- Industry-Academy-Government Collaboration (Example)
  - Need Clear Image of Role of each organization
  - Synergy effects and demonstrate of outcome
  - Research Outcomes and their Ownership and Licensing
  - Form of Consortium
  - Promote of International Cooperative Research for Solution to Strong Social Demand and Benefit

# Promotion of Structured International Industry-Academy(-Government ) Cooperative Research



○Partners  
Industry  
Academy  
Government  
Liaison Offices  
ELyT Lab.

○Mechanism for Mutual  
Strengthening  
Structured System

# Introduction

Engineering and Science Lyon ▪ Tohoku  
Laboratory (ELyT Lab)  
an International Associated Laboratory  
LIA, CNRS

## Co-Directors

Jean-Yves Cavaille, Prof. Institut National des  
Sciences Appliquees de Lyon, France

Philippe Kapsa, Prof. Ecole Centrale de Lyon, France

Tetsuo Shoji, Prof. Tohoku University, Sendai, Japan

# History & Objectives

**This project is based on a very close collaboration between two Lyon/France institutions (Ecole Centrale ECL and INSA, which belong to “Universite de Lyon”) and the Tohoku University in Japan for more than 15 years now. Originally, "Tribology" and "Intelligent materials" have been the key themes for joint research and sustainable cooperation.**

**In fact, Tribology, Materials and Mechanical engineering are identified as top-level in the Lyon region and at a national level in France. In Japan, Tohoku University is as well internationally recognized for its expertise in Fluid Mechanics (Institute of Fluid Sciences) and Material Sciences (Institute for Materials Research).**

**Thus, several types of collaboration have been jointly conducted such as:**

# History & Objectives

- Since 1997, 7 **bilateral seminars** have been organized (JFSIMS, Japan France Seminar on **Intelligent Materials and Systems**)
- In October 2003, an IRCP (**Inter Research Center Cooperative program**) has been implemented, with the support of CNRS and the JSPS. It has undoubtedly boosted the joint collaboration
- In 2004, Tohoku University has opened a "**Liaison Office**" in France, located at INSA de Lyon. INSA, at the same time opened its **Liaison Office** in the COE building of the Tohoku University
- In 2005, both French Institutions have signed a **double degree (Master level) agreement** with Tohoku University
- 4 **joint forum** have been organized, both in France and in Japan, promoting again **joint research and linkage with Industry**
- Students and researchers **mobility** in both ways
- Last December 2007, a **MoU** on International Joint Laboratory has been signed as a CNRS International Associated Laboratory (LIA)



Cont'd

2007 has been a special year as the three institutions have respectively celebrated their 150th (ECL), 100th (Tohoku University) and 50th (INSA) anniversary. To commemorate this auspicious occasion, two Japan-France Joint Forum "Lyon-Tohoku, teaming for the future" have been organized, one in February in Lyon and the second one in Tokyo-Sendai in December.

Both in education and in research, remarkable achievements had been accomplished and the success of these working sessions, highlighting more potential fields of cooperation and common values such as "international, excellence" obviously emphasized the growth of exchanges and the increasing determination towards furthering development.

Therefore it has been decided to implement an International Joint Laboratory as a relevant milestone.

# Objectives and Goal

- Engineering and Science in Lyon
- For three years now, 4 academic institutions in Lyon, namely, the Claude Bernard University (UCB), the “Ecole Normale Supérieure de Lyon” (ENS), ECL and INSA-Lyon, all belonging to the actual “ Université de Lyon” focused all together a large part of their human and research resources on a project so-called “Engineering@Lyon” (I@L, in French).
- Three aspects are covered :
  - **the first one** is mainly at **the academic and research** level (with the 4 institutions),
  - **the second one** corresponds to **academic-industry transfer** (so-called Carnot Institute, and mainly based on UCB, ECL and INSA resources)<sup>2</sup>
  - **the third one** focus on **the opening of dedicated experimental platforms** (such as “material, mechanical and tribology measurements”, “High-Tech equipments for microscopy” , “Micro-Nanotechnology process and characterization”, etc.).

# Objectives and Goal


- Key strengths boosted on Lyon side and Tohoku side
  - -Surfaces, Interfaces
  - -Fluids, Heat transfers, Energy
  - -Nanostructures, Nanomaterials, Nanotechnologies
  - -Bio-engineering
  - -Material and Mechanical Engineering

# Objectives and Goal

- **Engineering and Science in Tohoku University**
  - The University was accepted by the government as one of the top 5 WPI (World Premier International) research centers in Japan. On October 1, 2007, it established an exciting and innovative research center, WPI Advanced Institute for Materials Research, which aims to promote the development of new materials for interdisciplinary research.
  - It also carries out 8 projects of the COE Program and 5 projects of the Global COE (Center of Excellence) Program; the fields of engineering and science become the mainstream of these programs. By concentrating on the development of new research frontiers, Tohoku University intends to reinforce the strength of its research areas, focusing on engineering and science as well as interdisciplinary area which become the keys to improving the quality of human life and contributing to the society.

# Objectives and Goal

- Selected fields of study and Leaders
  - **Biosciences & Engineering (B)**
    - (F)Alain Cozzone & Michel Lagarde & (J)Noriko Osumi
  - **Durability, Reliability in Energy and Transportation (R)**
    - (F)Joel Courbon & (J)Yutaka Watanabe
  - **Nano & Micro Scale Materials & Devices (M)**
    - (F)Alain Fave & (J)Akihiko Chgiba
  - **Flow Dynamics, Heat Transfers and Microfluidics (F)**
    - (F)Jean-Pierre Bertoglio & (J)Makoto Ohta
  - **Tribology (T)**
    - (F)Denis Mazuyer & (J) Koshi Adachi

- 
- Connection with the Double Degree agreement
  - Connection with the liaison offices
  - **Collaboration with industrial partners**

LYON TOHOKU

リヨンー東北：将来に向けての提携

*Une alliance pour le futur*

*Teaming for the future*

# ELyT Lab

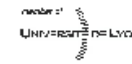
Engineering and Science  
Lyon Tohoku  
Laboratory



## ELyT Lab

	INSA	ECL	TOHOKU UNIVERSITY
Head	Prof. Jean-Yves Cavaille	Dr. Philippe Kapea	Prof. Tetsuo Shoji
Research Coordinator	Prof. Jean-Yves Cavaille	Dr. Philippe Kapea	Prof. Toshiyuki Takagi
Contact	Marie-Pierre Favre	Marie-Françoise El Fassi	Mariko Watanabe

**Ecole Centrale de Lyon,**  
**ECL, 36 Avenue Guy de Collongue, 69134 Ecully Cedex (France),**  
 Director: Professor Patrick Boivin



- INL Nanotechnologies Institute of Lyon (UMR 5270), headed at ECL by Professor Guy Hollinger,
- LMFA Laboratory of Fluid Mechanics and Acoustics (UMR 5509), Insitute at ECL by Professor Michel Lemerle,
- LTDS Laboratory of Tribology and Systems Dynamics (UMR 5513), headed by Professor Gérard Mezuer,

**Institut National des Sciences Appliquées de Lyon, INSA de Lyon,**  
**20, Avenue Albert Einstein, 69621 Villeurbanne (France),**  
 Director: Professor Alain Sturlu



- CETHIL Center of Heat Transfer of Lyon (UMR 5008), headed by Professor Denis Esquidé,
- INL Nanotechnologies Institute of Lyon (UMR 5270), headed at INSA by Professor Gérard Guillot,
- LGEF Ferroelectricity and Electrical Engineering Laboratory, headed by Professor Denis Guyomar,
- LMFA Laboratory of Fluid Mechanics and Acoustics (UMR 5509), headed at INSA by Professor Jean-Yves Champagnon,
- LAMICO Contact and Structure Mechanics Laboratory (UMR 5259), headed by Professor Alain Combescure,
- MATEIS, Materials, Engineering & Science (UMR 5510), headed by Professor Joël Courbon,
- MRND, Metabolic Regulation, Nutrition, Diabetes, headed by Professor Michel Lagarde,

**Tohoku University, 2-1-1 Katahira, Aoba-ku, Sendai, Miyagi Prefecture 980-8577, Japan,**  
 President: Akihiro Inoue

- GSE, Graduate School of Engineering, headed by Professor Tetsuo Uchida,
- IFS, Institute of Fluid Science, headed by Professor Toshiyuki Hayashi,
- IMR, Institute for Materials Research, Insitute by Professor Kazuo Nakajima



# LYON TOHOKU

リヨンー東北、将来に向けての提携

Une alliance pour le futur

Teaming for the future



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## Important news

The next annual workshop of ELYT lab will be held on next March 14 to 16, near Annecy. Not only works corresponding to the 5 main topics of our joint laboratory will be presented but a special session will be organized, focused on the role of free radicals in various degradation processes, including corrosion, bio-degradation, polymer degradation under irradiation, etc.

The tentative program will be available very soon.

## Welcome to ELYT Lab (Engineering and Science Lyon Tohoku Laboratory)



ELYT Lab is a French-Japanese joint research laboratory, involving the following institutions :

- [CNRS](#) French National Center for Scientific Research
- [ECL Ecole Centrale de Lyon](#)
- [INSA de LYON](#)
- [TOHOKU University](#)

## The research project consists in 5 main fields of study:

- [Biosciences & Engineering \(B\)](#),
- [Durability, Reliability in Energy and Transportation \(R\)](#),
- [Nano & Micro Scale Materials & Devices \(M\)](#),
- [Flow Dynamics, Heat Transfers and Microfluidics \(F\)](#),
- [Tribology \(T\)](#).

### Latest News

September. 01, 2009

#### Tohoku Lyon Summer School

Pr Alain Storck, Pr Patrick Bourgin, Pr Jean-Yves Cavallé, Dr Philippe Kapsa and Pr Tetsuo Shoji are glad to invite you to a cocktail in the context of the first summer school Lyon-Tohoku.

May. 26, 2009

**An important delegation from Lyon**, including the Mayor, will go to Japan to reinforce the already close links between Lyon and the country of the rising sun.

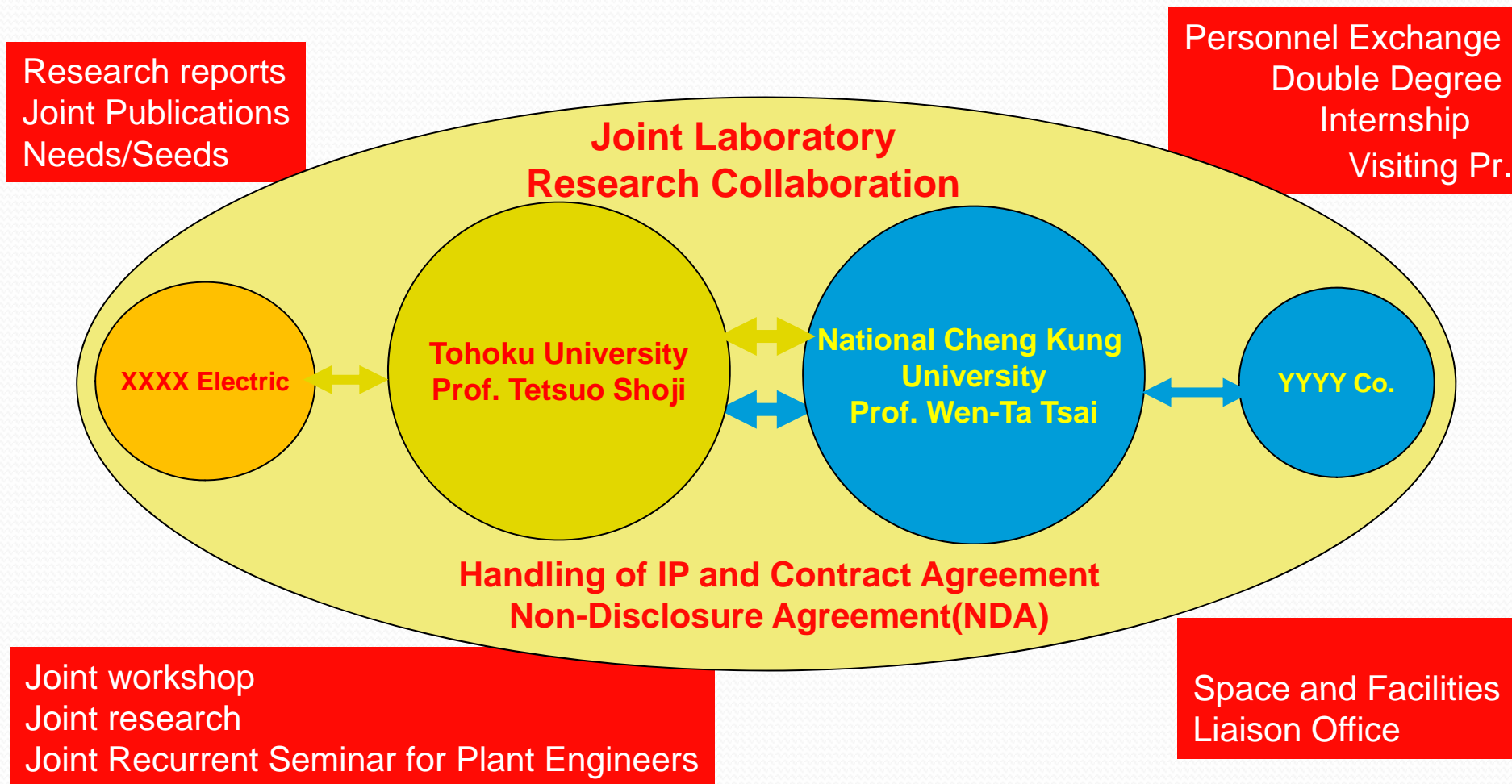
May. 26, 2009

**Tohoku Lyon Summer School** : For the first time, INSA Lyon is preparing a summer school

# Example of International Industry-Academy Collaboration

Development of Condition Monitoring  
Sensor and Mitigation Technology for  
Diagnosis of Corrosion Degradation of Steam  
Turbine between Taiwan and Japan

# " Methodology Development for Predictive and Preventive Maintenance of Power Plants Based upon Condition Monitoring".



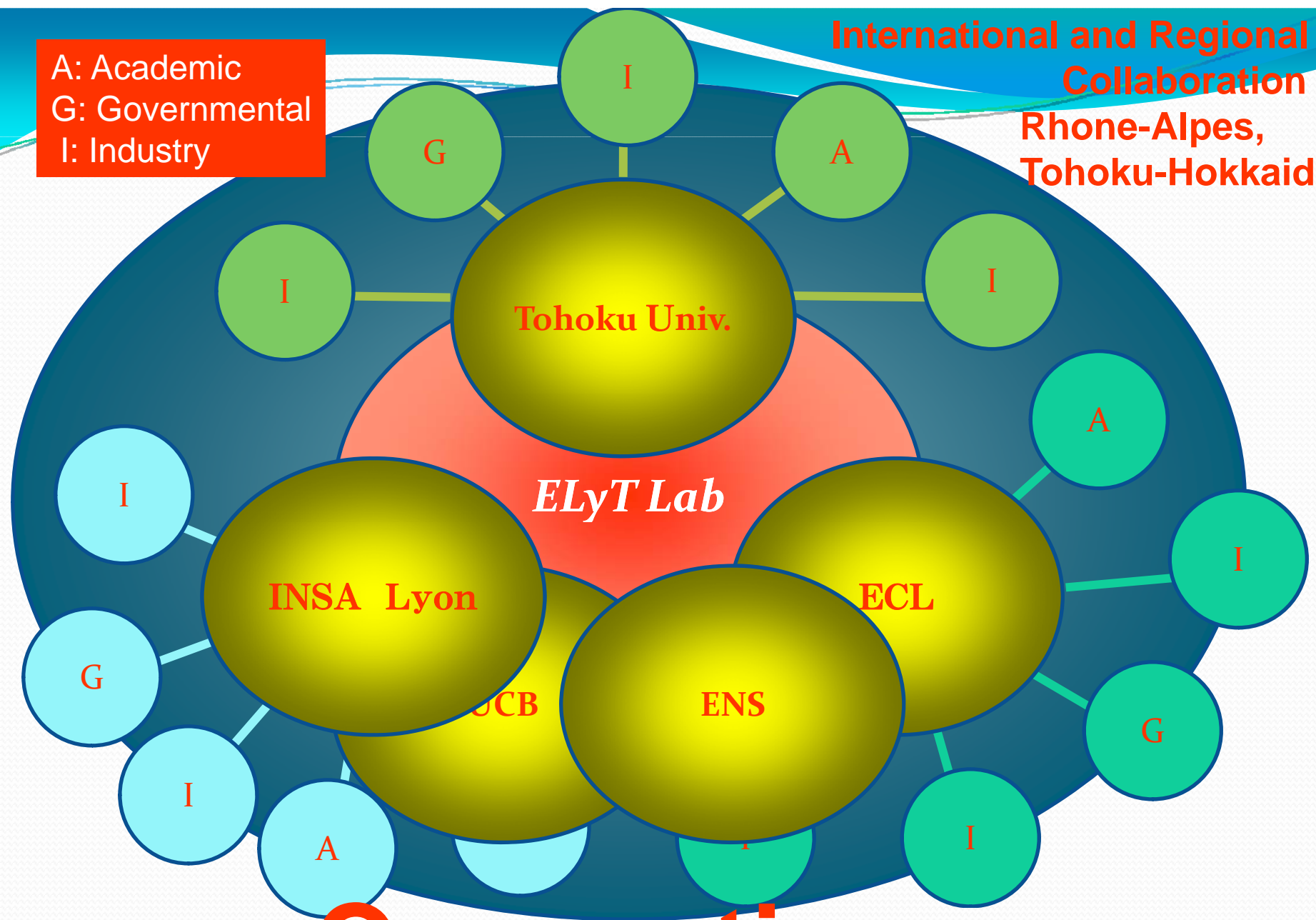
**Potential Target areas**  
**See the previous page**

# Formation of Alliance and Collaboration



A: Academic  
G: Governmental  
I: Industry

International and Regional  
Collaboration  
Rhone-Alpes,  
Tohoku-Hokkaido



# Consortium

# Technology Transfer

- Interaction with Industries
  - TOTAL, EdF SEPTEN, .....
  - Tohoku Electric Co. TEPCO, etc
- Interaction with other funding Agency
  - NEDO, JETRO, JST, JSPS etc
- Technology Licensing Office (TLO)
  - Tohoku Techno Arch & University IP Office
  - INSAVALOR
- Government Funds
  - NISA (Nuclear and Industries Safety Agency)
    - Tohoku-Hokkaido Cluster (see the next Map)

# NISA Program for Enhancement of Aging Management of NPP

## Tohoku・Hokkaido Cluster

# 東北・北海道クラスタ

東北大学を中核として、経年劣化の発生、進展メカニズムの解明と、応力腐食割れや配管減肉の進展予測を主なテーマとして取組むプロジェクト  
Project for Materials Degradation Evaluation for Long Term Operation of Nuclear Power Plants centered at Tohoku University with 12 Academic Organization

### 【研究テーマ】

- 応力腐食割れき裂進展則、初期き裂発生・進展メカニズム研究
- プロアクティブ材料経年劣化、潜在事象・潜在メカニズム研究
- 流れ型腐食、液的衝撃エロージョンによる減肉予測技術の高度化研究
- 減肉の定点監視・広域監視技術研究

### 実施体制

研究調整機関 (株)インテリジェント・コスモス研究機構

参加組織 東北大学、八戸工業大学、石巻専修大学、岩手大学、秋田県立大学、  
会津大学、新潟大学、長岡技術科学大学、北海道大学、室蘭工業大学、  
北海道工業大学、(独)産業技術総合研究所



Tohoku University, Hachinohe Institute of Technology, Ishinomaki Senshu University, Iwate University, Akita Prefectural University, Aizu University, Niigata University, Nagaoka Institute of Technology, Hokkaido University, Muroran Institute of Technology, Hokkaido Institute of Technology, Industrial Research Institute.

# Summary

- ELYT Lab. is just launched about a year ago and developing the activities in 5 areas but may be more in future
- ELYT Lab stands a good position to promote the regional innovation through international cooperation
- Annual meetings provides opportunities to the Lab. Member for deepening and widening the understanding and knowledge to collaborate with industries
- Need more interaction with (Regional) Industries through the ELYT Lab for mutual benefits in research and development and also for solutions to current issues of concerns
- Need more better research coordination, facilitation and moderation for innovation