The International Academy for Production Engineering

The CIRP Structure

CIRP – The International Academy for Production Engineering

President of CIRP

year 2018/2019

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CIRP – Its origins

- **Motivation** – The idea for the creation of CIRP came from French Engineer General Pierre Nicolau who understood, in the years following World War II, that it was essential:

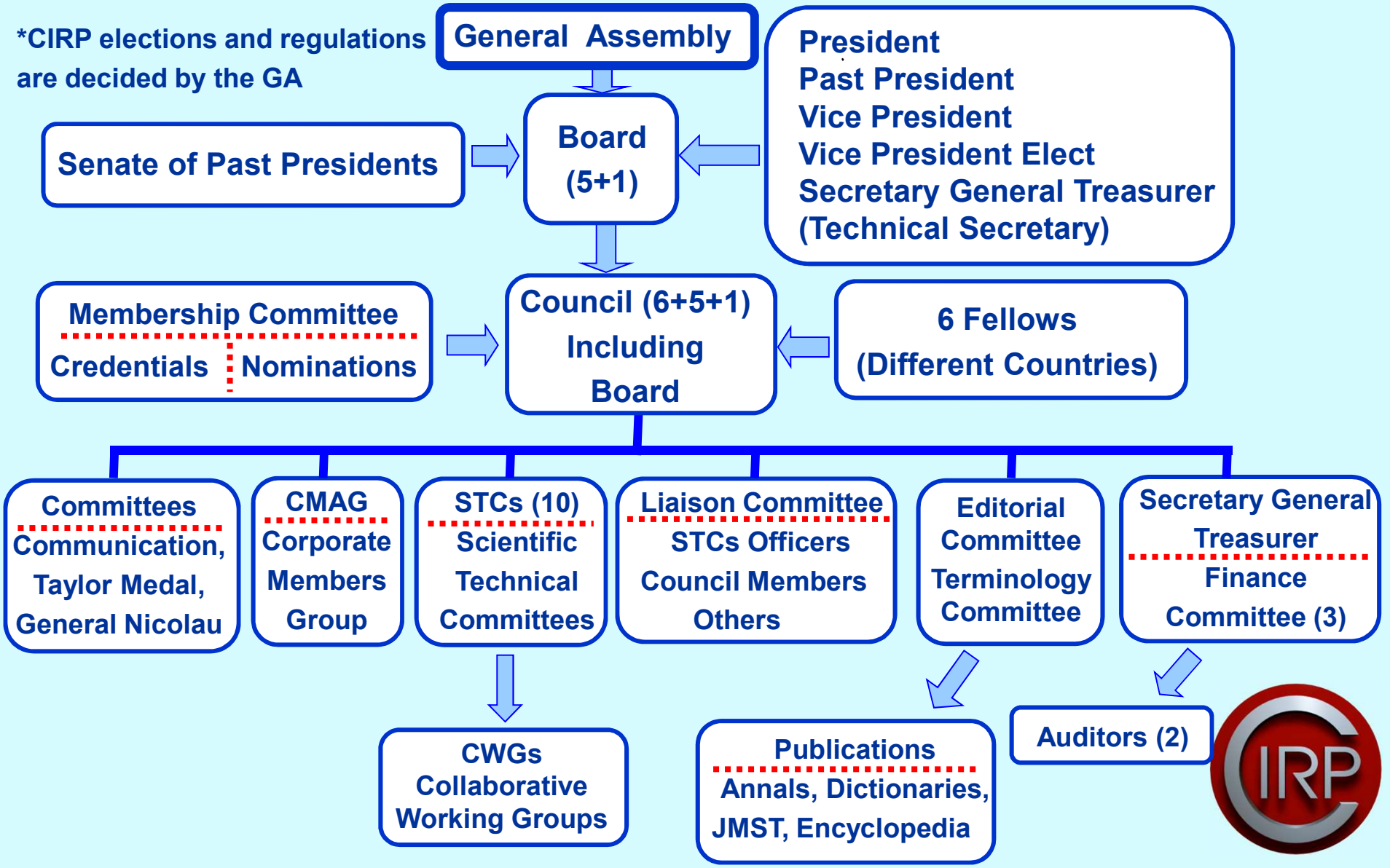
  To promote the scientific understanding of production engineering technologies in order to increase productivity of manufacturing industries

- **Official founders** – The following individuals, all deceased, are recognized as the official founders of CIRP in **1951**:
  - **Prof. Albert Portevin**, Member of the French Academy of Science, Paris, France
  - **Prof. Oscar Peters**, from the Catholic University of Leuven, Belgium, Member of the Flemish Academy of Sciences
  - **Dr. Donald F. Galloway**, Director of PERA (Production Engineering Research Association) at Melton Mowbray, Great Britain
  - **Prof. Erich Bickel**, Professor at the Eidgenoessische Technische Hochschule in Zurich, Switzerland
  - **Eng. Gen. Pierre Nicolau**, Former Director of the Laboratoire Central de l'Armement, Director of the Institut Supérieur des Matériaux et de la Construction Mécanique, France

CIRP – Aims and Field of Work

- Promote, by scientific research, the development of all aspects of manufacturing technology covering the optimization of processes, machines and systems.
- Develop cooperative research among the members of the Academy, and create opportunities for informal contacts among research workers.
- Emphasize the industrial applications of the fundamental research work performed and orient their choice of subjects for research towards the changing needs of industry.
- Organize an annual general assembly with keynote and paper sessions and scientific technical committee meetings.
- Publication of papers, reports, annals and other technical information.
- Organization and sponsorship of international conferences.

The CIRP Organization



Membership* in the CIRP 2018

Fellows (Emeritus)	Honorary Fellows	Corporate Members	Fellows	Associate Members	Research Affiliates	Invited Member
131	22	172	166	133	124	1
			Maximum 175	Maximum 150	Maximum 3 per Fellow	Maximum 5/One per New Country
			Maximum 20 per Country			

* Last update 30 August 2018

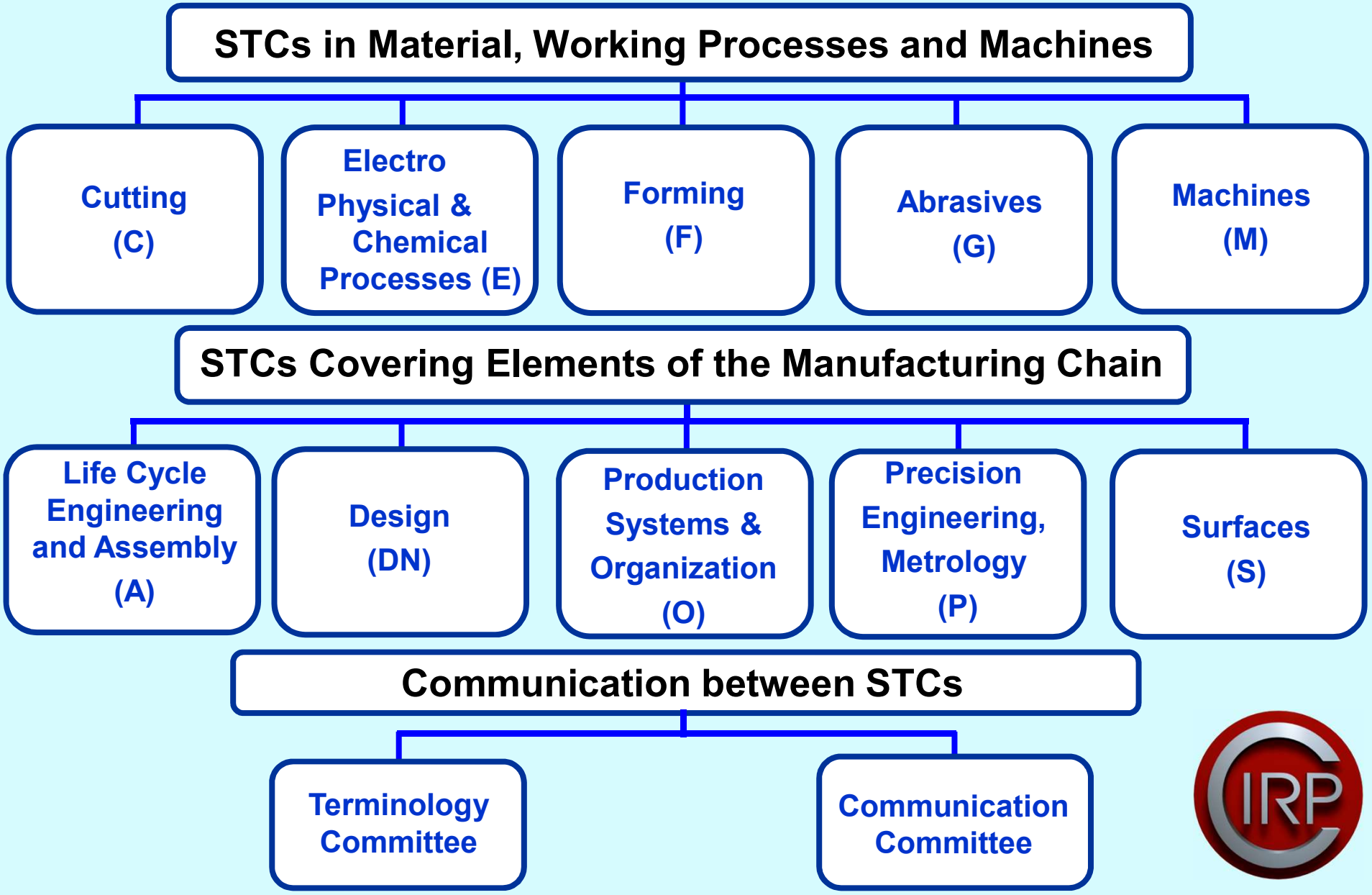
Countries with Representatives in the CIRP 2018

Australia
Austria
Belgium
Bosnia
Brazil
Canada
Chile
China Rep.
Croatia
Czech Rep.
Denmark
Egypt
Finland
France
Germany
Greece
Hong Kong
Hungary
India
Ireland
Israel
Italy
Japan
Korea
Mexico
Netherlands
Norway
Poland
Portugal
Rumania
Serbia
Singapore
Slovenia
South Africa
Spain
Sri Lanka
Sweden
Switzerland
Taiwan
Tunisia
Turkey
United Kingdom
Ukraine
USA
United Arab Emirates

New Contacts:

Columbia
Russia
Saudi Arabia
Slovakia

The Scientific Technical Committees (STC's)



The Scientific Technical Committees (STC's)

- **STC A – Deals with the two areas: Life Cycle Engineering and Assembly**
  - Life Cycle Engineering covers Life Cycle Assessment of products, manufacturing processes and systems, decision support methods and tools for developers and managers concerning the three sustainability dimensions (environment, society and economy) and product Life Cycle Management, EOL decision making such as disassembly, reuse and recycling.
  - Assembly covers Life cycle maintenance services, assembly technology, design for assembly, micro-assembly, structure and organization of assembly processes/systems considering all relevant aspects

- **STC C – Chip forming processes in shaping materials using simple or complex cutting tools including turning, milling, drilling, boring, tapping, including:**
  - Theoretical and experimental research in chip forming processes
  - Terminology, symbols and standards for cutting
  - Development, use and optimisation of cutting
  - All factors concerned with the machinability of materials
  - Optimisation of the technical and economic performance of the processes, including high speed, high removal rate and ultra precision machining of metallic and non-metallic materials
  - Modelling and data processing for planning and process control.

The Scientific Technical Committees (STC's)

- **STC Dn – Design is an integral part of the manufacturing system from its philosophical roots, through design theory, to optimised engineering design practice including:**
  - Principles, methodologies, creativity, education and training, organisation and quality aspects of design of components, products, processes, machines and manufacturing systems
  - Modelling, simulation and optimisation of computer aided engineering (CAE)/computer aided design (CAD) systems with particular reference to efficiency of dialogue between the designer and the computer system in selection of materials, tolerances, processes, machines, etc
  - Concurrent/simultaneous engineering
  - Terminology, symbols and standards for engineering design practice and systems.
- **STC E – Electro-physical, mechanico-chemical, chemical and energy beam processes for manufacturing materials and components with optimised technical and economic performance including:**
  - Analysis, modelling, simulation and research for existing and new processes against the criteria of productivity, environmental effects, material and component properties, tolerances and surface properties, etc.
  - Innovation of new 'non-conventional' processes
  - Aspects of processes affecting machine design and control for optimisation within manufacturing systems
  - Terminology, symbols and standards for electro-physical and chemical processes
  - Modelling and data processing for planning and process control.

The Scientific Technical Committees (STC's)

- **STC F – Processes in which the final shape is conferred by plastic deformation of material (in the form of powders, bars, plates, cast or sintered slugs); pressure joining and the separation processes (stamping, shearing, etc.) are also covered including:**
  - Application of the theory of plasticity to all industrial forming processes, together with the tribological and materials engineering aspects
  - Theoretical and experimental research for technological and economic optimisation of processes, forming machines, dies and moulds
  - Process modelling, simulation and data processing for production planning and control
  - Terminology, symbols and standards for forming processes and machines.

- **STC G – Study and research into material removal processes using abrasive grains such as grinding and abrasive finishing, attention is largely focus on the mechanism of finishing, the integrity of finished surfaces and the economics of abrasive processes.**
  - Theoretical and experimental research in abrasive finishing processes
  - Innovation and development of finishing technologies with fixed abrasive, free abrasive and flow abrasive tools
  - Modeling, simulation and verification of abrasive finishing processes
  - Optimization of technical and economic performance of the processes

The Scientific Technical Committees (STC's)

- **STC M – Machine systems including machine tools, robots, measuring machines and handling equipment, for optimised technical and economic performance including:**

- Research, design, development, manufacture and optimised application of production machine systems
- Characterization of machine system performance such as quasi-static and dynamic behaviour, accuracy, ergonomics, efficiency, cost of ownership and suitability for use in FMS and CIM systems
- Design for optimised performance of sub-systems and components such as structures, guideways, spindles, servo actuators, displacement transducers, sensors, servo control theory and systems, CNC systems, adaptive control, expert systems and artificial intelligence applied to advanced machine systems
- Application of new materials, design for higher machine accuracy capabilities including 2D/3D error compensation, thermal drift reduction and control, tool setting and tool wear compensation etc.
- Modelling, simulation, modal analysis, testing and metrological calibration of machine systems
- Terminology, symbols and standards for production machine systems.

The Scientific Technical Committees (STC's)

- **STC O – Optimization of the total manufacturing system from product and system design through planning for information and materials processing to implementation against the criteria of technical and economic performance, quality and human factors including:**

  - Design for the market, design for economic manufacture
  - Group technology, factory equipment selection and layout for FMS and CIM systems
  - Application of computers to manufacturing systems including system modelling, simulation, monitoring and control
  - Information technology, Computer Aided Engineering, CAD/CAM, self - optimising control, expert systems and artificial intelligence applied to manufacturing systems
  - Quality assurance and control for total manufacturing systems, implementing quality improvement programmes for total business quality
  - Human factors in manufacturing, education and training
  - Terminology, symbols and standards for manufacturing systems
  - Responsibility for proposing new areas of activity for the other STCs and for promoting a system approach to advanced manufacturing.

The Scientific Technical Committees (STC's)

- **STC P – Research, design, development and application of sensors, transducers and complete metrology systems to precision machines for the efficient control of quality in production processes and manufacturing systems including:**

  - The metrology of length, angle, displacement, profile, surface topography and surface integrity applied as closely as possible to the point of manufacture
  - Design and error budgeting for optimised control strategies in metrology equipment and ultra precision machine tools, etc.
  - Sensors for acceleration, force, velocity, temperature, pressure etc. for quality monitoring and control
  - Nano-metrology for application to nanotechnology processes and machines
  - Responsibility for surveying emerging processes and machine systems for nanotechnology applications, research and development
  - Metrological calibration of machines, sub-systems and instruments for 2D and 3D geometrical and thermal error compensation
  - Terminology, symbols and standards for engineering metrology and precision engineering.

The Scientific Technical Committees (STC's)

- **STC S – Study and research into the geometrical, physical, and chemical properties of the surface and near surface regions in relation to function, production processes and metrological assessment. Disciplines practiced include:**
  - Surface metrology
  - Nanotechnology
  - Micro-engineering
  - Surface manufacturing processes
  - Tribology

  Previous work includes major input into international surface metrology standards and collaborative projects on measuring surface hardness, residual stresses, subsurface damage and crack detection on surfaces.

- **Terminology Committee: This committee carries responsibility for publication of the CIRP dictionaries and encyclopaedia on Advanced Manufacturing Engineering. The dictionaries and encyclopaedia cover definitions and terminology for manufacturing processes, machines, tooling, materials and systems formulated by the other STCs.**

CIRP Publications

- **CIRP Annals (under ISI standards)**
  - **Vol. 1**: Refereed papers by Fellows, Associate, Corporate and Research Affiliates
  - **Vol. 2**: Refereed keynote papers
- **CIRP Journal of Manufacturing Science and Technology**
  - In-depth versions of the best papers from CIRP conferences, and original contributions from authors worldwide. Four issues per year
- **Special Work**
  - Dictionaries and Encyclopedia of Production Engineering,
  - Proceedings of CIRP Conferences on Procedia-CIRP
- **Newsletter:** Twice a year
- **CIRP Industrial Technical Papers from Corporate members**
  - Published in the Journal of Manufacturing Science and Technology

CIRP Conferences

- CIRP Conference on Manufacturing Systems (CMS)
- CIRP Conference on Life Cycle Engineering (LCE)
- CIRP Design Conference
- CIRP IPS2
- CIRP Conference on Intelligent Computation in Manufacturing Eng. (ICME)
- CIRP Conference on Electro Physical and Chemical Machining (ISEM)
- CIRP Conference on Modeling of Machining Operations (CMMO)
- CIRPe (Web conference organized by the CIRP Research Affiliates)
- CIRP Conference on Biomanufacturing (BioM)
- CIRP Conference on Assembly Technologies and Systems (CATS)
- CIRP Conference on Computer Aided Tolerancing (CAT)
- CIRP Conference on High Performance Cutting (HPC)
- CIRP Conference on Surface Integrity (CSI)
- CIRP Conference on Composite Materials Parts Manufacturing

CIRP Presidents and General Assemblies 1951-2022

Countries	CIRP General Assemblies	CIRP Presidents
Australia	1980-2000	1967-1983
Belgium	1952-1965-1982	1955-1964-1973-2001
Canada	1981-2003-2021	2017
China	1997-2012	
Czech Republic	1961	1968
Denmark	2013	2006-2021
France	1951-56-66-76-92-2001-2014	1951/54-57-77-96-2004-2019
Germany	1954-60-75-90-2007-2020	1959-65-70-78-86-91-99-2008-2016
Greece	1998	2007
Hungary	2011	2014
India	1977	
Ireland		2010
Israel	1986	2002
Italy	1955-64-70-85-96-2010	1962-72-79-93-2003-2013
Korea		1995
Japan	1974-88-2006-2018	1985-94-2005-2015-2020
Netherlands	1953-62-78-95	1963-75-88-98-2011
Norway	1989	1982-97
Poland	1971-2004	1974
Portugal	2016	
Singapore	1994	2012
South Africa	2015	
Spain	2002-2022	
Sweden	1957-72	1956-90
Switzerland	1959-69-79-99-2017	1958-71-81
Turkey	2005	
UK	1958-68-83-93-2008-2019	1960-66-84-89
USA	1963-67-84-91-2009	1961-69-76-87-92-2000-2009-2018
Ex-Yugoslavia	1973-87	1980

CIRP Collaboration Research Network