



# ICAF

International Committee  
on Aeronautical Fatigue  
and Structural Integrity

## Welcome to our webinar

Marcel Bos, ICAF General Secretary | June 30<sup>th</sup>, 2021

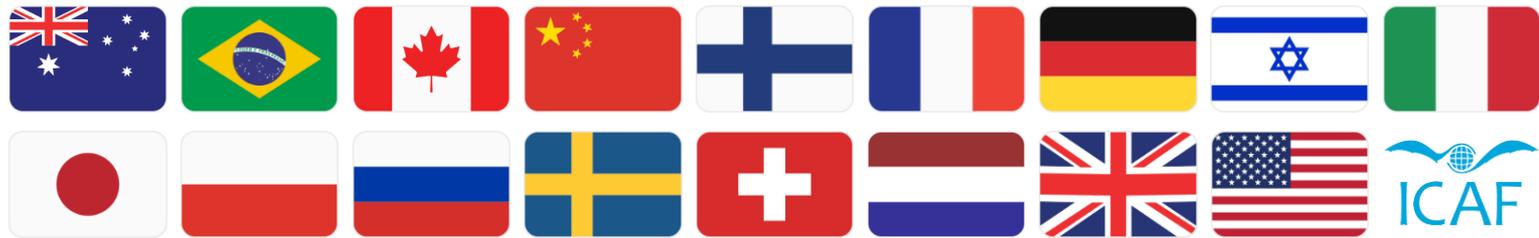
# Agenda

- **Welcome** 15 minutes
  - ICAF introduction & website Marcel Bos, Netherlands Aerospace Centre
- **Trends and developments in aeronautical fatigue and structural integrity** 80 minutes
  - Industry perspective Yuval Freed, Israel Aerospace Industries
  - Digital trends Min Liao, NRC Canada
  - New materials and processes Elke Hombergsmeier, Airbus Technology Germany
  - Regulator perspective Michael Gorelik, FAA, USA
- **Jaap Schijve Award for young researchers** 20 minutes
  - Announcement of winner René Alderliesten, TU Delft, Netherlands
  - Schijve Award Lecture Award recipient
- **Our next live event** 5 minutes
  - ICAF 2023 promotional video



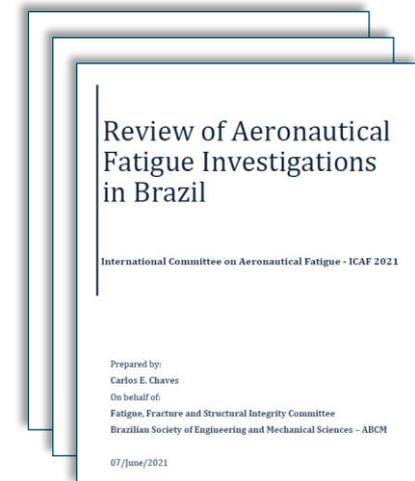
# ICAF in short

We represent 17 countries from all over the world



We promote the exchange of information  
on aeronautical fatigue & structural integrity

- We organize a live event every two years
- Our USP... the national reviews  
(and the participants!)



# ICAF, the people



## We are all volunteers

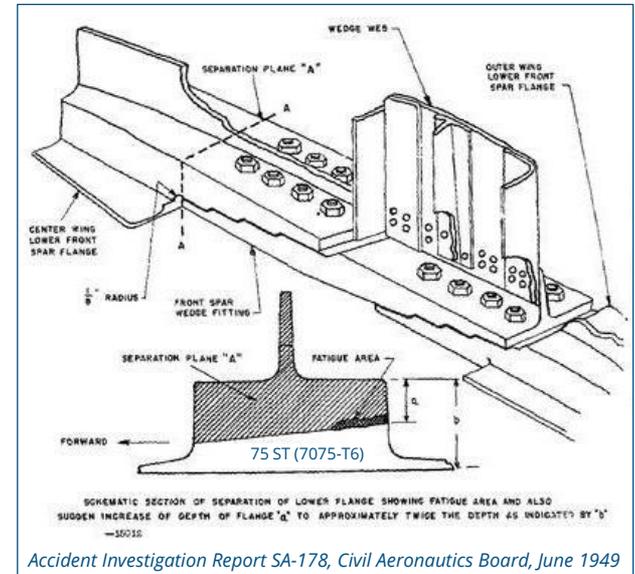
- ICAF has no budget
- Each one of us is sponsored by her/his own organization
- We perform our activities in the fringes of our daily jobs

# How it started

- Founded in 1951
  - Growing concerns regarding fatigue in metal aircraft structures
- International Committee on Aeronautical Fatigue
  - First conference in Amsterdam, 1952
  - Netherlands, UK, Sweden, Belgium, Switzerland



Dr. ir. Frederik J. Plantema,  
October 21, 1911 – November 13, 1966



# Some landmark fatigue failures



R.J.H. Wanhill, L. Molent, S.A. Barter and E. Amsterdam (2015). Milestone Case Histories in Aircraft Structural Integrity. NLR Technical Publication TP-2015-193.

C.F. Tiffany, J.P. Gallagher, and C.A. Babish, IV (2010). Threats to Aircraft Structural Safety, incl. a Compendium of Selected Structural Accidents / Incidents. ASC-TR-2010-5002.

# 70 years of interaction

- Conferences
- Symposia
- Plantema lectures



Year	Conference	Symposium	Location	Plantema Lecturer
1952	1	-	Amsterdam	-
1953	2	-	Stockholm	-
1955	3	-	Cranfield	-
1956	4	-	Zurich	-
1957	5	-	Brussels	-
1959	6	1	Amsterdam	-
1961	7	2	Paris	-
1963	8	3	Rome	-
1965	9	4	Munich	-
1967	10	5	Melbourne	J. Branger
1969	11	**	Stockholm	J. Schijve
1971	12	6	Miami	E.L. Ripley
1973	13	7	London	E. Gassner
1975	14	8	Lausanne	S. Eggwertz
1977	15	9	Darmstadt	H.F. Hardrath
1979	16	10	Brussels	A.J. Troughton
1981	17	11	Noordwijkerhout	O. Buxbaum
1983	18	12	Toulouse	J.Y. Mann

# 70 years of interaction



- Jaap Schijve Award
  - Since 2009
  - See separate presentation

Year	Conference	Symposium	Location	Plantema Lecturer
1985	19	13	Pisa	L. Jarfall
1987	20	14	Ottawa	T. Swift
1989	21	15	Jerusalem	J.B. De Jonge
1991	22	16	Tokyo	R.M. Bader
1993	23	17	Stockholm	U.G. Goranson
1995	24	18	Melbourne	W. Schütz
1997	25	19	Edinburgh	J.W. Lincoln
1999	26	20	Bellevue (Seattle)	J.C. Newman, Jr.
2001	27	21	Toulouse	A.F. Blom
2003	28	22	Luzern	L.B. Vogelesang
2005	29	23	Hamburg	H.-J. Schmidt
2007	30	24	Naples	J.P. Gallagher
2009	31	25	Rotterdam	J. Rouchon
2011	32	26	Montréal	G. Clark
2013	33	27	Jerusalem	J.L. Rudd
2015	34	28	Helsinki	J. Komorowski
2017	35	29	Nagoya	A.Brot
2019	36	30	Krakow	S. Swift

# We are still relevant

## International Committee on Aeronautical Fatigue & Structural Integrity

- Composite and hybrid aircraft structures
- SHM & NDI
- Additive manufacturing
- Digital twinning
- Etc... → next four pitches!



Credit: SIEMENS



## Outlook

- Aging fleets
- UAM
- Sustainable air travel
  - New propulsion concepts, new fuels
  - New airframe concepts
  - Advanced materials & processes

- Implications for SI ???



### AIRBUS

### Aviation's path towards zero emissions



[Credit: Airbus]

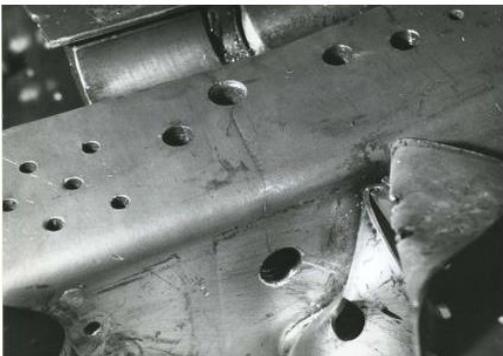
## Our website



<https://www.icafe.aero>



# International Committee on Aeronautical Fatigue and Structural Integrity (ICAF)



ICAF brings together civil and military aircraft operators, manufacturers, research centres, academia and regulatory agencies from all over the world. We aim to promote the development of working relations and the exchange of information between experts in the multi-disciplinary field of aircraft structural integrity.

[ICAF 2021 WEBINAR](#)



- Mission
- Member countries
- People
- Awards

## General info - Member countries

Originally, ICAF started with five member countries only, while other countries were invited to join later. New member countries can still be invited to join ICAF upon agreement of the committee members. The current ICAF member countries are listed below.

- Australia
- Brazil
- Canada
- China
- Finland
- France
- Germany
- Israel
- Italy
- Japan
- Netherlands
- Poland
- Russia
- Sweden
- Switzerland
- United Kingdom
- United States of America



- Mission
- Member countries
- People
- Awards

# General info - People

**Ben Main**



Ben Main joined Defence Science and Technology Group in 2017 after 21 years' service in the Royal Australian Air Force (RAAF). During his Air Force engineering career Ben saw operational service with No. 75 Squadron (Hornets) in Iraq 2003, completed postings as the Airframe Deputy Team Lead for the US Joint Strike Fighter Program Office (JPO) and as the Deputy Director for Aircraft Structural Integrity / Head of Design at the Defence Aviation Safety Authority (DASA).

Ben has a Bachelor of Aeronautical Engineering from UNSW-ADFA and Master's Degrees in Fracture Mechanics (Purdue) and Business Administration (Deakin). In 2015 Ben was appointed a Member of the Order of Australia for his work in Defence aircraft engineering, sustainment and acquisition.

Ben is currently the Group Leader of Structural and Materials Experimentation at Aerospace Division of DSTG and the Australian National Delegate to the International Committee on Aeronautical Fatigue and Structural Integrity (ICAF).

**Ben Main**

**Carlos E. Chaves**



**Dr. Min Liao**



- Events
- International recognition
- Former General Secretaries
- Miscellaneous

# Events

Year	Conference number	Symposium number	Location	Plantema Medal recipient	Schijve Award recipient
1951	Foundation	-	Cranfield	-	-
1952	1	-	Amsterdam	-	-
1953	2	-	Stockholm	-	-
1955	3	-	Cranfield	-	-
1956	4	-	Zurich	-	-
1957	5	-	Brussels	-	-
1959	6	1	Amsterdam	-	-
1961	7	2	Paris	-	-
1963	8	3	Rome	-	-
1965	9	4	Munich	-	-
1967	10	5	Melbourne	-	-
1969	11	-	Stockholm	J. Schijve (Netherlands)	-
1971	12	6	Miami	E.L. Ripley (UK)	-
1973	13	7	London	E. Gassner (Germany)	-



- National reviews ▾
  - 2021
  - 2019
  - 2017
  - 2015
  - 2013
  - 2011
  - 2009
  - 2001 - 2009
  - Pre - 2001
- Symposium proceedings
- Plantema lectures
- General ICAF presentations
- Historical documents
- Disclaimer

## National reviews

< 2019 **2021**

- [ICAF 2021 National Review - Australia.pdf](#)
- [ICAF 2021 National Review - Brazil.pdf](#)
- [ICAF 2021 National Review - China.pdf](#)
- [ICAF 2021 National Review - Finland.pdf](#)
- [ICAF 2021 National Review - France.pdf](#)
- [ICAF 2021 National Review - Israel.pdf](#)
- [ICAF 2021 National Review - Italy.pdf](#)
- [ICAF 2021 National Review - Japan.pdf](#)
- [ICAF 2021 National Review - Netherlands.pdf](#)
- [ICAF 2021 National Review - Sweden.pdf](#)
- [ICAF 2021 National Review - Switzerland.pdf](#)
- [ICAF 2021 National Review - UK\\_v1.pdf](#)



- National reviews ▾
  - 2021
  - 2019
  - 2017
  - 2015
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  - 2011
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  - 2001 - 2009
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## National reviews

< 2017 **2019** 2021 >

- [Australian\\_National\\_Review\\_2019.pdf](#)
- [Brazilian\\_National\\_Review\\_2019\\_mod.pdf](#)
- [Canadian\\_National\\_Review\\_2019\\_mod.pdf](#)
- [China\\_National\\_Review\\_2019.pdf](#)
- [Finland\\_National\\_Review\\_2019-min.pdf](#)
- [French\\_National\\_Review\\_2019.pdf](#)
- [German\\_National\\_Review\\_mod.pdf](#)
- [Israel\\_National\\_Review\\_2019.pdf](#)
- [Italy\\_National\\_Review\\_2019.pdf](#)
- [Japan\\_National\\_Review\\_2019.pdf](#)
- [Polish\\_National\\_Review\\_2019-min.pdf](#)
- [Russian\\_National\\_Review\\_2019.pdf](#)
- [Sweden\\_National\\_Review\\_2019.pdf](#)
- [Switzerland\\_National\\_Review\\_2019.pdf](#)
- [The\\_Netherlands\\_National\\_Review\\_2019.pdf](#)
- [UK\\_National\\_Review\\_2019.pdf](#)



- National reviews
- Symposium proceedings
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- Historical documents
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# Documents

## Plantema lectures

- 0000\_-\_Overview\_Plantema\_Lectures.pdf
- 1967\_-\_Branger\_-\_The\_International\_Committee\_on\_Aeronautical\_Fatigu.pdf
- 1969\_-\_Schijve\_-\_Cumulative\_Damage\_Problems\_In\_Aircraft\_Structures\_.pdf
- 1971\_-\_Ripley\_-\_The\_Philosophy\_Which\_Underlies\_The\_Structural\_Test.pdf
- 1973\_-\_Gassner\_-\_Fatigue\_Life\_Of\_Structural\_Components\_Under\_Random.pdf
- 1975\_-\_Eggwertz\_-\_Reliability\_Analysis\_of\_Wing\_Panel\_Considering\_Tes.pdf
- 1977\_-\_Hardrath\_-\_Advanced\_Composites\_-\_The\_Structures\_of\_the\_Future.pdf
- 1979\_-\_Troughton\_-\_33\_Years\_Of\_Aircraft\_Fatigue.pdf
- 1981\_-\_Buxbaum\_-\_Landing\_Gear\_Loads\_Of\_Civil\_Transport\_Airplanes.pdf
- 1983\_-\_Mann\_-\_Aircraft\_Fatigue\_-\_with\_Particular\_Emphasis\_on\_Aus.pdf
- 1985\_-\_Jarfall\_-\_Fatigue\_And\_Damage\_Tolerance\_Work\_During\_The\_Aircr.pdf
- 1987\_-\_Swift\_-\_New\_materials\_and\_fatigue\_resistant\_aircraft\_desig.pdf
- 1989\_-\_Jonge\_-\_Assessment\_of\_service\_load\_experience.pdf
- 1991\_-\_Bader\_-\_Structural\_Integrity\_Challenges.pdf
- 1993\_-\_Goranson\_-\_Damage\_Tolerance\_-\_Facts\_and\_Fiction.pdf
- 1995\_-\_Schutz\_-\_Corrosion\_Fatigue\_-\_The\_Forgotten\_Factor\_in\_Assess.pdf
- 1997\_-\_Lincoln\_-\_Ageing\_Aircraft\_-\_USAF\_Experience\_and\_Actions.pdf
- 1999\_-\_Neuman\_-\_Advances\_in\_Fatigue\_and\_Fracture\_Mechanics\_Analysi.pdf



- National reviews ▾
- Symposium proceedings
- Plantema lectures
- General ICAF presentations
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# Documents

## Symposium proceedings

Our future symposium proceedings will be published here.

# You are welcome to our next live event!

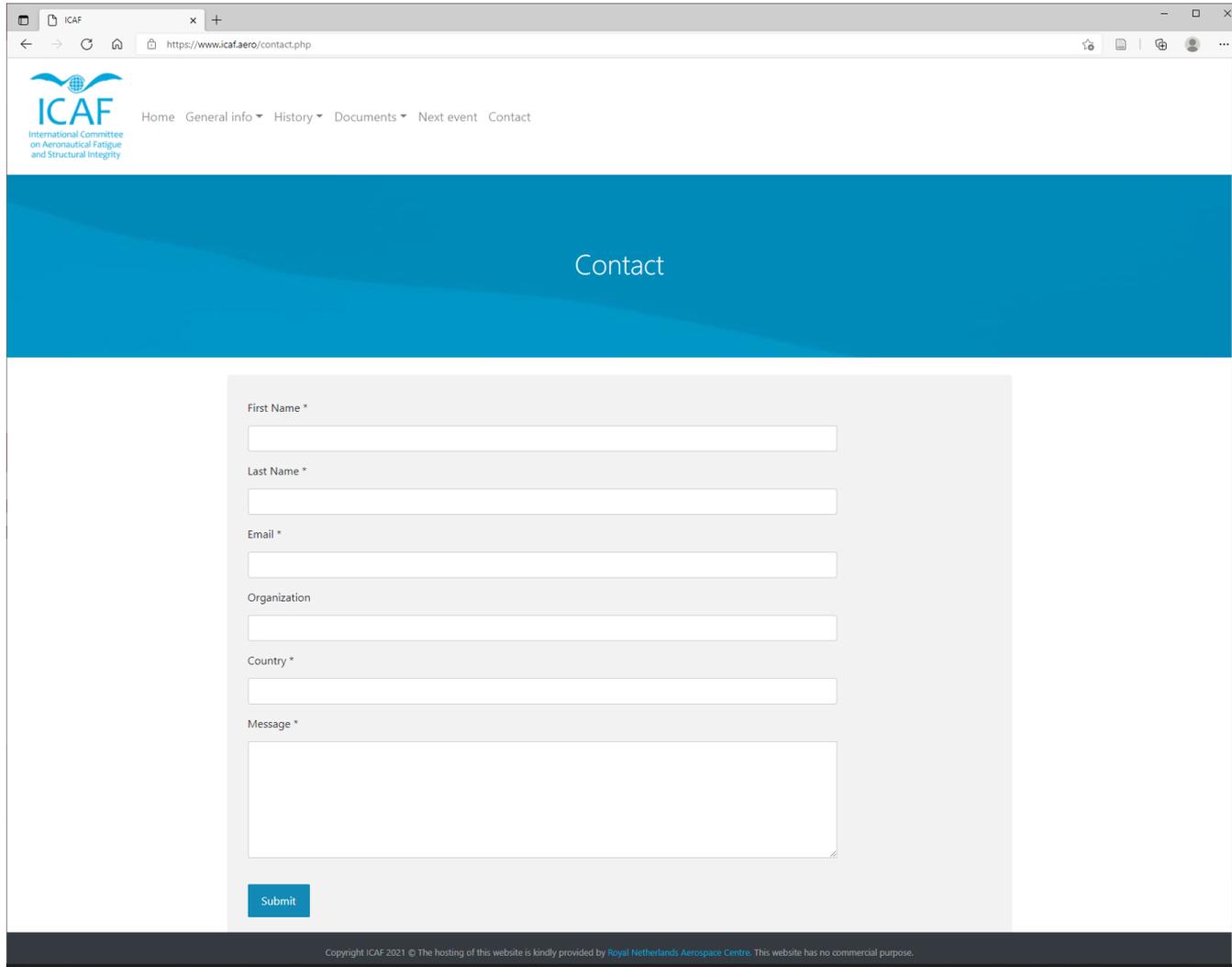
## ICAF 2023

- Xi'an, China, 5-9 June 2023



Oman





The screenshot shows a web browser window with the URL <https://www.icafaero/contact.php>. The page header includes the ICAF logo and a navigation menu with links for Home, General info, History, Documents, Next event, and Contact. The main content area features a large blue banner with the word "Contact" in white. Below the banner is a contact form with the following fields: First Name \*, Last Name \*, Email \*, Organization, Country \*, and Message \*. A blue "Submit" button is located at the bottom of the form. The footer of the page contains the text: "Copyright ICAF 2021 © The hosting of this website is kindly provided by Royal Netherlands Aerospace Centre. This website has no commercial purpose."