

MATHEMATICAL APPROACH TO CLIMATE CHANGE IMPACTS

INDAM, Rome, March 13 – 17 2017

<http://congressi.iac.cnr.it/MAC2I>

Invited Speakers

- A. Bracco, Georgia Tech, Atlanta
- A. Fiori, Univ. Roma TRE, Rome
- E. Foufoula-Georgiou, Univ. of California, Irvine
- A. Fowler, Univ. of Limerick, Co. Limerick
- K. Fraedrich, Univ. of Hamburg, Hamburg
- M. Gatto, Polytechnic of Milan, Milan
- M. Ghil, Univ. of California, Los Angeles
- R. Greve, Univ. of Hokkaido, Sapporo
- C. K. R. T. Jones, Univ. of North Carolina, Chapel Hill
- T. Lenton, Univ. of Exeter, Exeter
- R. Malek-Madani, U. S. Naval Academy, Annapolis
- P. Martinez, Paul Sabatier University, Toulouse
- J. Oerlemans, Univ. of Utrecht, Utrecht
- K. R. Rajagopal, Univ. Texas A&M, College Station
- M. Yamamoto, Univ. of Tokyo, Tokyo

$$\begin{aligned} & \sin 2\alpha = 2 \sin \alpha \cos \alpha; \quad \cos 3\alpha = \frac{\cos^3 \alpha - 3 \cos \alpha}{3 \cos^2 \alpha - 1}; \quad \sin 2\alpha = 2 \sin \alpha \cos \alpha \\ & \tan 2\alpha = \frac{2 \tan \alpha}{1 - \tan^2 \alpha}, \quad \tan 3\alpha = \frac{3 \tan \alpha - \tan^3 \alpha}{1 - 3 \tan^2 \alpha}; \quad \sin^2 \alpha = \frac{1 - \cos 2\alpha}{2} \\ & \cos 2\alpha = \frac{\cos^2 \alpha - \sin^2 \alpha}{1 + \cos 2\alpha}; \quad \cos 3\alpha = \frac{\cos^3 \alpha - 3 \cos \alpha}{4 \cos^2 \alpha - 1}; \quad \cos 2\alpha = \frac{1 - \cos 2\alpha}{2} \\ & \tan \frac{\alpha}{2} = \pm \sqrt{\frac{1 - \cos \alpha}{2}} = \frac{\sin \alpha}{1 + \cos \alpha} = \frac{1 - \cos \alpha}{\sin \alpha}; \quad \tan \frac{\alpha}{2} = \frac{\sin \alpha}{1 + \cos \alpha} \\ & \cot \frac{\alpha}{2} = \frac{1 + \cos \alpha}{\sin \alpha}; \quad \cot \alpha = \frac{\cos \alpha}{\sin \alpha} = \frac{\cos \alpha}{\sin \alpha} \\ & \sin \alpha = \sin \alpha \cos \beta + \cos \alpha \sin \beta; \quad \sin(\alpha + \beta) = \sin \alpha \cos \beta + \cos \alpha \sin \beta \\ & \cos \alpha = \cos \alpha \cos \beta - \sin \alpha \sin \beta; \quad \cos(\alpha + \beta) = \cos \alpha \cos \beta - \sin \alpha \sin \beta \\ & \tan \alpha = \frac{\sin \alpha}{\cos \alpha}; \quad \tan(\alpha + \beta) = \frac{\tan \alpha + \tan \beta}{1 + \tan \alpha \tan \beta}; \quad \tan(\alpha - \beta) = \frac{\tan \alpha - \tan \beta}{1 - \tan \alpha \tan \beta} \\ & \cot \alpha = \frac{\cos \alpha}{\sin \alpha} = \frac{1}{\tan \alpha} = \frac{1}{\sin \alpha \cos \alpha} = \frac{\cos^2 \alpha + \sin^2 \alpha}{\sin \alpha \cos \alpha} = \frac{1 + \cos 2\alpha}{\sin 2\alpha} \end{aligned}$$

Scientific and Organizing Committee

- P. Cannarsa, University "Tor Vergata", Rome
- D. Mansutti, IAC (CNR), Rome
- A. Provenzale, IGG (CNR), Pisa