

**ATE  
HEFAT  
2021**



Heat Transfer Fluid Mechanics  
and Thermodynamics  
Applied Thermal Engineering  
**VIRTUAL CONFERENCE**  
26-28 July 2021

# CERTIFICATE

OF AWARD FOR

**BEST PAPER**

IN

**TWO-PHASE FLOW 2**

AWARDED TO

**LARGE EDDY SIMULATION OF BUBBLE FLOW IN BUBBLE COLUMN  
REACTOR BY CONSIDERING TURBULENT DIFFUSION EFFECT AND  
BUBBLE OSCILLATION**

Shanshan Long, Xiaogang Yang (University of Nottingham Ningbo China, ), Jie  
Yang (University of Hull, United Kingdom) and Xiaobing Huang (Glyndwr  
University Wrexham, United Kingdom)

AT

**THE 15<sup>th</sup> INTERNATIONAL CONFERENCE ON HEAT TRANSFER, FLUID  
MECHANICS AND THERMODYNAMICS (HEFAT) AND EDITORIAL  
BOARD OF APPLIED THERMAL ENGINEERING (ATE)**

Prof. J.P. Meyer  
ATE-HEFAT 2021 | Conference Chair  
Head of Mechanical and Aeronautical Engineering,  
Faculty of Engineering, Built Environment & IT  
University of Pretoria

**ATE  
HEFAT  
2021**



Heat Transfer Fluid Mechanics  
and Thermodynamics  
Applied Thermal Engineering  
**VIRTUAL CONFERENCE**  
26-28 July 2021

**CERTIFICATE**  
OF  
**ORAL PRESENTATION**

AWARDED TO

**Shanshan Long**

**FOR PRESENTING**

**LARGE EDDY SIMULATION OF BUBBLE FLOW IN BUBBLE COLUMN REACTOR  
BY CONSIDERING TURBULENT DIFFUSION EFFECT AND BUBBLE OSCILLATION**

Shanshan Long, Xiaogang Yang (University of Nottingham Ningbo China, ), Jie Yang (University of Hull,  
United Kingdom) and Xiaobing Huang (Glyndwr University Wrexham, United Kingdom)

AT

**THE 15<sup>th</sup> INTERNATIONAL CONFERENCE ON HEAT TRANSFER, FLUID  
MECHANICS AND THERMODYNAMICS (HEFAT) AND EDITORIAL  
BOARD OF APPLIED THERMAL ENGINEERING (ATE)**

Prof. J.P. Meyer  
ATE-HEFAT 2021 | Conference Chair  
Head of Mechanical and Aeronautical Engineering,  
Faculty of Engineering, Built Environment & IT  
University of Pretoria