ACMT

Association of Computational Mechanics Taiwan

PROGRAM

第一屆台灣計算力學會議

1st Association of Computational Mechanics Taiwan (ACMT) Conference

2015. 10. 22-23, Taipei

Yeong-Bin Yang 楊永斌
Chao-An Lin 林昭安
Liang-Jenq Leu 呂良正
Chuin-Shan David Chen 陳俊杉

第一屆台灣計算力學會議

1st Association of Computational Mechanics Taiwan (ACMT) Conference

http://www.acmt.info/2015/

October 22-23, 2015

Taipei, Taiwan

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歡迎您

It takes a community, toward computational mechanics.

非常歡迎您來參加由台灣計算力學學會在台北舉辦的第一屆台灣計算力學會議。舉辦此會議最重要的目的是強化大家在計算力學領域的交流，一齊來耕耘台灣在計算力學領域的發展。這是第一屆，是一個非常重要的開始，我們在 2014 年暑假就埋下此種子，希望這次及後續的台灣計算力學會議都能充分結合計算固力與計算流力的學者，共同耕耘與努力，發展計算力學。

我們花了相當多的心血來舉辦這次的計算力學會議，希望讓您有所收穫。計算力學領域處理的問題相當廣，上自天文，下至原子與電子的行為，有蠻數學、物理導向的，也有蠻應用導向的。要辦好計算力學會議，深思後我們覺得有三個重要的要素：第一是傑出的大會演講、第二是熱心的 minisymposium (MS)主辦人、第三是熱情的參與老師與同學。我們非常感謝兩位在計算固力領域傑出的學者丁承先教授與陳俊賢教授、兩位在計算流力領域傑出的學者吳宗信教授與徐昆教授為我們帶來非常精彩的大會演講，相信這四場演講就會讓您覺得不虛此行。我們也要特別感謝許多熱心的 MS 主辦人，他們的努力是這次會議成功最重要的要素。我們更期待透過 MS 機制，可以讓您與志同道合的朋友一起深化討論您關心的研究議題。最後我們也深深期待您的熱情參與，這是最好的場合與熟識的老友敘舊，也藉此認識新的朋友，千萬不要錯過喔。

楊永斌、林昭安、呂良正、陳俊杉

第一屆台灣計算力學會議主席

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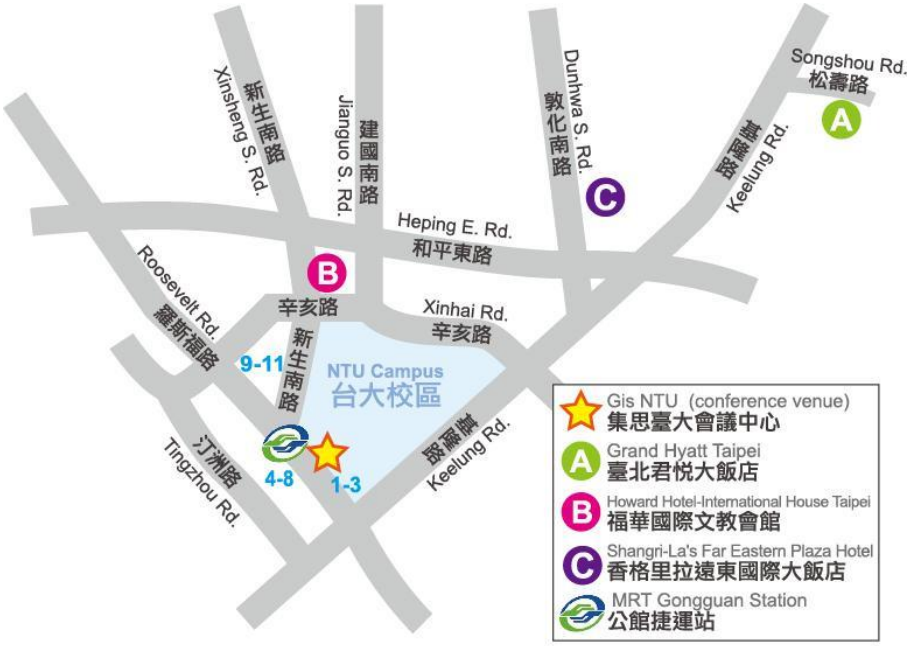
Conference Information

- **Date**

  October 22-23, 2015

- **Venue**

  GisNTU Convention Center 集思臺大會議中心 (國立台灣大學第二活動中心 B1)
  Address: B1, No.85, Sec. 4, Roosevelt Rd., Da'an Dist., Taipei City 106, Taiwan
  台北市羅斯福路四段 85 號 B1



- **Venue Transportation**

  - **By metro**

    捷運

    捷運新店線　公館站2號出口：
    2號出口左轉 (步行2分鐘)

  - **By car**

    開車

    公館水源市場對面羅斯福路上，近羅斯福路與基隆路交叉口
    國道一號：由松江路交流道下，轉建國高架道路南行至和平東路出口，續行辛亥路至基隆路右轉，直行至羅斯福路再右轉，隨即於右側「台灣大學公館二活停車場」停車即可。

    國道三號：由台北聯絡道下辛亥路端，接基隆路右轉羅斯福路，隨即於右側「台灣大學公館二活停車場」停車即可。

■ **By bus**

公車

捷運公館站一 (羅斯福路)：254
捷運公館站 (公車專用道-往西區方向)：
0南、1、109、208、208(高架線)、208(區間車)、208(基河二期國宅線)、236、251、252、253、278、284、284(直行)、290、52、642、643、644、648、660、671、672、673、676、74、907、
景美女中-榮總快速公車、棕12、綠11、綠13、藍28
捷運公館站 (公車專用道-往新店方向)：207、278、280、280(直達車)、284、311、505、530、606、606區間車、668、675、676、松江幹線、松江-新生幹線、敦化幹線、藍28
公館 (羅斯福路基隆路口)：671
公館 (基隆路)：1 207 254 275 275(副) 650 672 673 907 南港軟體園區通勤專車(雙和線)
仁愛路二段：214.248.606
信義杭州路口(往101)：0東.20.22.204.670.671信義幹線.信義新幹線.1503

■ **Presentation Notes**

1. Plenary speakers are free to deliver their speech in English or in Mandarin. The minisymposium organizers can determine presentation and discussion language format in their session.
2. Each session keynote talk will be limited to 30 minutes. Each invited and regular talks will be limited to 20 minutes; the time will include questions and answers (Q&A) for the talk.
3. Each session will be equipped with a Windows laptop and a Laser pointer. Presenters are welcome to use their own laptop as well. Nevertheless, we strongly encourage you to have a backup of your presentation on a USB storage device, in case your laptop has a technical problem or is incompatible with the LCD projector.
4. If you are using a Mac, please prepare the Mini DVI to DVI Adapter by yourself.
5. Please arrive at least 10 minutes earlier for your session so that all the presentations can be set up at the beginning of the session.

■ **Lunch and Internet Access**

Lunch boxes will be available from the registration desk.

The wireless internet access is available at the conference venue.

Account: GIS-??? **Password:** 85B1A08C04

Wireless account is not fixed, where the ??? is a number based on your location.

■ **Nearby Restaurant**

Location	No.	Restaurant
GisNTU Nearby	1.	筷子餐廳 Chopstix Chinese Restaurant 台北市羅斯福路四段 85 號 No.85, Sec. 4, Roosevelt Rd., Da'an Dist., Taipei City
	2.	龐德羅莎 Ponderosa Steakhouse 台北市羅斯福路四段 85 號 2F 2F., No.85, Sec. 4, Roosevelt Rd., Taipei City
	3.	茄子洋廚 La Maison du Aubergine 台北市大安區羅斯福路四段 85 號 2F 2F., No.85, Sec. 4, Roosevelt Rd., Da'an Dist., Taipei City
	4.	義國蔬食餐廳 Gugo Kitchen 台北市大安區羅斯福路四段 85 號 No.85, Sec. 4, Roosevelt Rd., Da'an Dist., Taipei City
	5.	艾茉蕾披薩店 Amore Pizzeria 台北市大安區羅斯福路四段 140 號 No.140, Sec. 4, Roosevelt Rd., Da'an Dist., Taipei City
	6.	維綸麵食館 台北市中正區汀州路三段 279 號 No.279, Sec. 3, Tingzhou Rd., Zhongzheng Dist., Taipei City
	7.	天麻蒙古鴛鴦火鍋專賣 Tian Ma Mongolian Hot Pot 台北市中正區汀州路三段 297 號 No.297, Sec. 3, Tingzhou Rd., Zhongzheng Dist., Taipei City
MRT Gongguan Nearby	8.	CoCo 壹番屋 CoCo Ichibanya Curry House 台北市大安區羅斯福路四段 1 號 No.1, Sec. 4, Roosevelt Rd., Da'an Dist., Taipei City
	9.	麥當勞 McDonald 台北市中正區羅斯福路四段 76 之 1 號 No.76-1, Sec. 4, Roosevelt Rd., Zhongzheng Dist., Taipei City
	10.	阿剛泰式主題餐廳 Thai Cuisine Restaurant 台北市中正區汀州路三段 150 號 No.150, Sec. 3, Tingzhou Rd., Zhongzheng Dist., Taipei City
	11.	石頭公石頭火鍋 Stone PaPa Hot Pot 台北市中正區汀州路三段 92 號 No.92, Sec. 3, Tingzhou Rd., Zhongzheng Dist., Taipei City
	12.	馬辣頂級麻辣鴛鴦火鍋 Mala Yuanyang Hotpot 台北市中正區汀州路三段 86 號 No.86, Sec. 3, Tingzhou Rd., Zhongzheng Dist., Taipei City
	13.	GoGo Pasta 台北市中正區羅斯福路三段 316 巷 14 號 No.14, Lane 316, Sec. 3, Roosevelt Rd., Zhongzheng Dist., Taipei City
	14.	人之初-麻辣膠原嫩骨麵潮州滷味 台北市中正區羅斯福路三段 316 巷 3-1 號 No.3-1, Lane 316, Sec. 3, Roosevelt Rd., Zhongzheng Dist., Taipei City

	15.	貳樓餐廳 Second Floor Café 台北市中正區羅斯福路三段 316 巷 9 弄 7 號 No.7, Aly. 9, Lane 316, Sec. 3, Roosevelt Rd., Zhongzheng Dist., Taipei City
	16.	水源會館 La Marée 台北市中正區思源街 16 號 2 樓 2F., No.16, Siyuan St., Zhongzheng Dist., Taipei City
Xinsheng S. Rd. Nearby	17.	肯德基 KFC 台北市大安區新生南路三段 96-1 號
	18.	七里亭 台北市大安區羅斯福路三段 333 巷 8 號
	19.	俄羅斯城堡 Русская Кухня 台北市大安區羅斯福路三段 333 巷 14 號 No.14, Lane 333, Sec. 3, Roosevelt Rd., Da'an Dist., Taipei City
	20.	集客人間茶館 台北市大安區羅斯福路三段 333 巷 18 號 No.18, Lane 333, Sec. 3, Roosevelt Rd., Da'an Dist., Taipei City
	21.	爭鮮迴轉壽司 Sushi Express 台北市大安區新生南路三段 88-4 號 No.88-4, Sec. 3, Xinsheng S. Rd., Da'an Dist., Taipei City
	22.	會津屋日式食堂 Aizuya Japanese Restaurant 台北市大安區新生南路三段 60 巷 12 號 No.12, Lane 60, Sec. 3, Xinsheng S. Rd., Da'an Dist., Taipei City
	23.	Mr.J.藤原豆腐店 Mr. J Tofu Shop 台北市大安區溫州街 74 巷 6 號 No.6, Lane 74, Wenzhou St., Da'an Dist., Taipei City
	24.	彩椒廚房 Bell Pepper Kitchen 台北市大安區溫州街 74 巷 5 弄 1 號 No.1, Aly. 5, Lane 74, Wenzhou St., Da'an Dist., Taipei City
	25.	中東食堂 SABABA PITA BAR 台北市大安區羅斯福路三段 283 巷 17 號 No.17, Lane 283, Sec. 3, Roosevelt Rd., Da'an Dist., Taipei City
	26.	哥德德式創意美食 Goethe Gourmet Gasthaus 台北市大安區羅斯福路三段 283 巷 11 號 No.11, Lane 283, Sec. 3, Roosevelt Rd., Da'an Dist., Taipei City

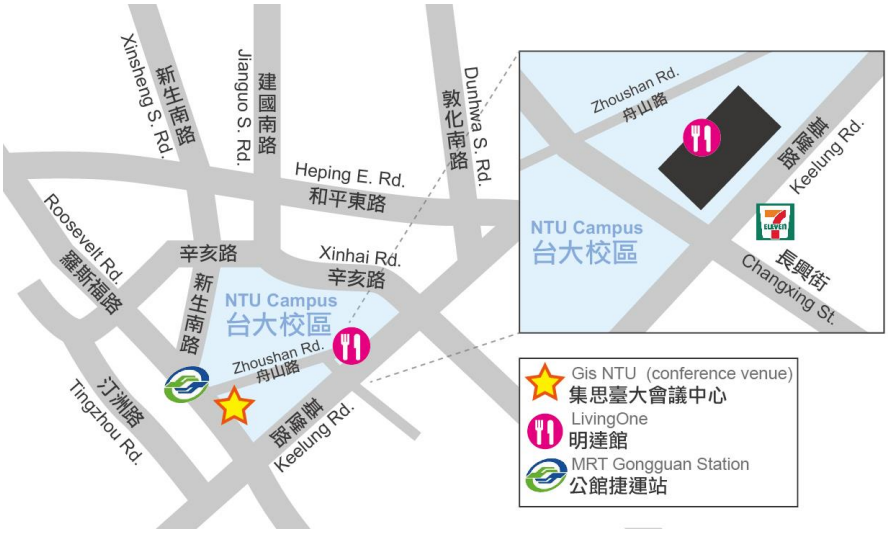
■ Conference Special Events

■ Welcome Reception, 17:30-20:00, October 21 (Wednesday)

LivingOne 明達館 17:30-18:00 Registration and Welcome Drink

Tel: (02) 23649691 18:00-20:00 Welcome Reception

台灣大學明達館一樓基隆路三段與長興街口(Intersection of Keelung Rd. and Changxing St., Da'an District, Taipei City)

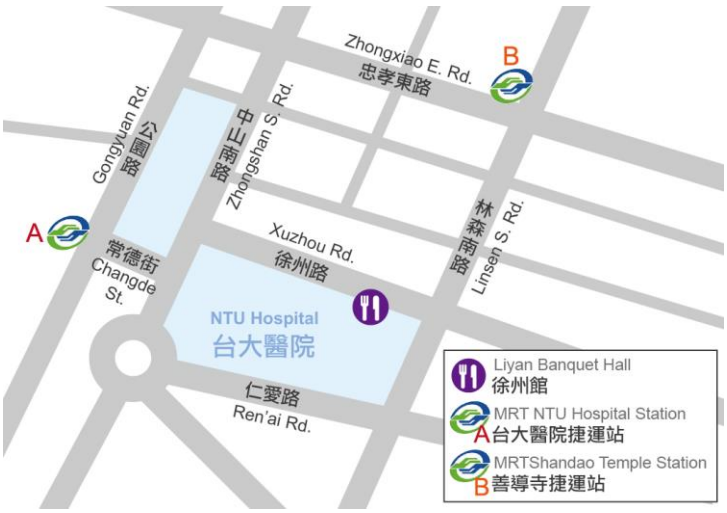


■ Conference Banquet and Closing Ceremony, 18:30-20:30, October 23 (Friday)

R402, 4F, Liyan Banquet Hall 徐州館

Tel: (02) 23928888

台北市中正區徐州路 2 號 (No. 2, Xuzhou Rd, Zhongzheng District, Taipei City)



TECHNICAL PROGRAM

(2015/10/22-23)

Conference Chairmen

Yeong-Bin Yang 楊永斌, National Taiwan University
Chao-An Lin 林昭安, National Tsing Hua University
Liang-Jenq Leu 呂良正, National Taiwan University
Chuin-Shan David Chen 陳俊杉, National Taiwan University

List of Minisymposia

MS001 Motion Analyses of Solids & Structures by the Vector Form Intrinsic Finite Element (VFIFE) Method
Chung-Yue Wang, Ren-Zo Wang and Yuan-Feng Duan

MS002 Biomechanical Analysis, Modeling, and Implant Designs
Po-Jen Shih and Chang-Wei Huang

MS003 Advances in CFD
Yang-Yao Niu and Shu-San Hsiau

MS004 Recent Advances in Meshless (Meshfree) Methods
Chia-Ming Fan, Pai-Chen Guan and Judy P. Yang

MS005 Materials Modeling
Nien-Ti Tsou

MS006 Recent Advances of Acoustic Waves in Periodic Structures
I-Ling Chang ,Jia-Hong Sun and Hsin-Haou Huang

MS007 Complex Fluids
Ching-Yao Chen

MS008 Computational mechanics of fluid-solid interaction and its applications
Chien-Kai Wang and Chuin-Shan David Chen

MS009 Modeling of composite materials, structures or systems
Yun-Che Wang and Sergei Alexandrov

MS010 Structural, Mechanical, and Thermal Properties of Nanomaterials from Atomistic Simulations
Chun-Wei Pao and Wen-Jay Lee

MS011 Study of Granular Media and its Flow with Particle-based Simulations
Guo-Jie Jason Gao and Fu-Ling Yang

MS012 Advanced Numerical Simulations for Fluid-Structure Interaction
Ming-Jyh Chern, Chao-An Lin and Chuan-Chieh Liao

MS013 Smart Structural Health Monitoring and Control Systems
Chi-Chang Lin, Lyan-Ywan Lu and Shih-Yu Chu

MS014 Computational Dynamic Response of Bridge Structures
Yu-Chi Sung, Yeong-Bin Yang and Liang-Jenq Leu

MS015 Computational mechanics of advanced structures and materials for engineering applications
Shu-Wei Chang and Tzu-Kang Lin

MS017 Computational Biomedicine and biomechanics
Maxim Solovchuk and Tony W.H. Sheu

General Program

Time	October 21, 2015					
1730-2000	Welcome Reception					
Time	**October 22, 2015**					
0800-0820	Registration					
0820-0830	Opening Ceremony					
0830-0910	**Plenary Speech I: Edward C. Ting** Chair: Chung-Yue Wang 向量式計算力學理論					
0910-0950	**Plenary Speech II: Kun XU** Chair: Chao-An Lin Modeling and Computation for Non-equilibrium Transport Processes					
0950-1010	Coffee Break					
1010-1220	MS001-1	MS013-1	MS011	MS006	MS008	MS017
1220-1320	Lunch					
1320-1530	MS001-2	MS013-2	MS002	MS004-1	MS012-1	
1530-1550	Coffee Break					
1550-1800	MS005-1	MS013-3	MS010-1	MS004-2	MS012-2	
1830-2030	Appreciation Party for Plenary Speakers and Minisymposium Organizers					
Time	**October 23, 2015**					
0830-0910	**Plenary Speech III: Jiun-Shyan (JS) Chen** Chair: Chuin-Shan David Chen Fracture to Damage Multiscale Mechanics and Modeling					
0910-0950	**Plenary Speech IV: Jong-Shinn Wu** Chair: Yen-Sen Chen Progress on Modeling Rarefied Gas Flows Using Unstructured Direct Simulation Monte Carlo Method					
0950-1010	Coffee Break					
1010-1220	MS005-2	MS003-1	MS010-2	MS004-3	MS014-1	MS015-1
1220-1320	Lunch					
1320-1530	MS007-1	MS003-2	MS010-3	MS009-1	MS014-2	
1530-1550	Coffee Break					
1550-1800	MS007-2	MS003-3	MS015-2	MS009-2	MS014-3	
1830-2030	Conference Banquet and Closing Ceremony					

Thursday, October 22nd
Technical Program

Time	October 22, 2015					
0800-0820	Registration					
0820-0830	Opening Ceremony					
0830-0910	**Plenary Speech I: Edward C. Ting** Chair: Chung-Yue Wang 向量式計算力學理論					
0910-0950	**Plenary Speech II: Kun XU** Chair: Chao-An Lin Modeling and Computation for Non-equilibrium Transport Processes					
0950-1010	Coffee Break					
1010-1220	MS001-1	MS013-1	MS011	MS006	MS008	MS017
1220-1320	Lunch					
1320-1530	MS001-2	MS013-2	MS002	MS004-1	MS012-1	
1530-1550	Coffee Break					
1550-1800	MS005-1	MS013-3	MS010-1	MS004-2	MS012-2	
1830-2030	Appreciation Party for Plenary Speakers and Minisymposium Organizers					

Thursday, October 22nd

Plenary Speech (I)
0830-0910 (Socrates 蘇格拉底廳)

向量式計算力學理論

Edward C. Ting

Emeritus Professor, Lyles School of Civil Engineering, Purdue University
中央大學榮譽教授

向量式力學是一個以計算爲考量的結構理論。以這個架構為基礎，可以發展三維柔性結構的分析程序，用來處理不同構件如剛架、固體、和板殼等的組合，以及如結構變形、空間運動，和碎裂崩塌等的行為變化。

本文對向量式架構的概念作簡略的介紹:

一。用**途徑單元**來處理構件運動和變形的過程。時間軌迹用一組連接的單元來描述。每一個單元，如 $t_a \le t \le t_b$，可以作獨立的分析；構件的幾何與材料性質、控制方程、以及制約條件都不改變。在連接的時間奌上，如 t_a 及 t_b，性質和行爲則可以是不連續的。單元之內的幾何變形是一個大轉動與小變形問題，分析以 t_a 時的構件作爲參考形態。

二。用**點值描述**來模擬固體構件。構件爲連續體，點位置用一組連續函數表示。函數的定義是：(1)取一組空間點上的量值爲獨立變數，任意一點的值用內插函數計算；(2) 在一個途徑單元內，任意時間的點位置用相同的內插函數來計算。假設空間點有質量，則運動及變形的控制方程可以用質點運動方程表示。空間點之間有因變形而產生的互制內力向量。

三。用虛擬的**逆向運動**來計算純變形量。由于在途徑單元之內的構件變化是一個大轉動與小變形問題，逆向運動之目的是要降低轉動的量值，使得虛擬形態的變形分析是一個小轉動與小變形問題。這樣，內力和純變形就可以用工程應力和微應變公式計算；內力向量則可以用功能等效關係來定義。再經過正向運動回到原位置，便得到原來構件內的應力和空間點上的質點力向量。

分析以途徑單元爲片段，隨著時間逐步地推進。在途徑單元之內，有兩組公式：一是獨立空間點的運動方程；它是用點上的質點力向量來計算點位置。另一是內力計算公式。假如，內插函數所引用的獨立點構成了一個連續的空間單元，就可以用空間單元的純變形來計算應力和點上的內力。第一組公式是時間積分的計算；第二組可以採用類似于有限元法中的元分析步驟來計算。因此，這個理論有兩個基本的計算迴圈。

Keywords: 計算固體力學，結構理論，柔性結構，大變形分析，碎裂，有限元法

Thursday, October 22nd

Plenary Speech (II)
0910-0950 (Socrates 蘇格拉底廳)

Modeling and Computation for Non-equilibrium Transport Processes

Kun Xu

Chair Professor, Department of Mathematics and Department of Mechanical and Aerospace Engineering
Hong Kong University of Science and Technology (HKUST)

All fluid dynamic equations are valid under their modeling scales, such as the particle mean free path and mean collision time scale of the Boltzmann equation and the hydrodynamic scale of the Navier-Stokes (NS) equations. From the Boltzmann equation to the hydrodynamic equations, the degree of freedom changes greatly for the description of the highly non-equilibrium to the nearly equilibrium states. Due to the difficulties of non-equilibrium flow modeling and the appropriate selection of physical variables between the above two limiting scales, there is basically no any successful governing equation in the whole transition regime. However, the emerging engineering applications, such as air-vehicle design for near space flight, heat and flow transfer in micro-devices, and radiative and neutron transport through different medium, do require the development of reliable simulation methods for multiple scale transport processes. In order to construct such a multi-scale and multi-physics simulation method, similar to the derivation of the Boltzmann or the Navier-Stokes governing equations, the development of numerical algorithm is better based on the direct modeling with a variation of physical scale. Since all computations are conducted in a discretized space, it is fortunate that we can directly choose the mesh size and time step as the physical modeling scale, and the numerical scheme is intrinsically to construct the valid governing equations in such a scale. As the mesh size varies from the particle mean free path scale to the hydrodynamic scale for resolving the dissipative layer, the direct modeling method will recover the corresponding physics from the Boltzmann transport to the NS wave propagation. So, instead of using the methodology of numerical partial differential equations, the computation becomes a direct construction of discrete evolution equations, where the mesh size and time step play dynamic roles in the modeling process. With the variation of the ratio between mesh size and local particle mean free path, the direct modeling method will capture different flow physics in different scales. Besides the modeling of gas dynamic transport, the direct modeling principle can be equally applied to the study of other multi-scale transport processes, such as the radiative transfer and plasma physics.

Keywords: Unified gas-kinetic scheme, non-equilibrium flow, radiative transfer, plasma physics

Thursday, October 22, 2015 Time: 1010-1200	
MS001-1 **阿基米得廳** **Archimedes**	**Motion Analyses of Solids and Structures by the Vector Form Intrinsic Finite Element (VFIFE) Method** *Chair: Chung-Yue Wang*

1010-1040	126	**Simulation of Earthquake-induced Collapse of a Mockup Cable-stayed Bridge by Vector Form Intrinsic Finite Element (VFIFE) Method (Keynote Lecture)** *Y. F. Duan, K. He, H.M. Zhang, E. C. Ting, C. Y. Wang, R. Z. Wang*
1040-1100	143	Design of a Coupled Continuous-Discontinuous Simulation Platform based on VFIFE-DEM Methods (Invited Lecture) *Wei-Tze Chang, Shang-Hsien Hsieh*
1100-1120	81	Dynamic Analysis of Bridges with Rocking Isolation in Ultimate States *Tzu-Ying Lee, Peng-Yu Chen, Min-Yan Huang*
1120-1140	111	Development of a Triangular Shell Element by the VFIFE Method for the Large Displacement Analysis of Thin Shell Structures *Shih-Hung Chen, Ren-Zou Wang, Chung-Yue Wang*
1140-1200	106	Numerical Simulation and Verification of the Vector Form Pre-stressed Concrete Frame Element *Chen Ming Huang, Ren-Zou Wang, Chung-Yue Wang*

Thursday, October 22, 2015 Time: 1010-1200	
MS006 **拉斐爾廳** **Rafael**	**Recent Advances of Acoustic Waves in Periodic Structures** *Chair: Jung-San Chen*

1010-1040	48	**Observation and Analysis of a New Designed Auxetic material (Keynote Lecture)** *Yen-Chang Chou, Bao-Leng Wong, Hsin-Haou Huang*
1040-1100	65	The Lamb Wave Velocity in Phononic Crystal Slabs (Invited Lecture) *Guan-Hua Huang, I-Ling Chang, Yung-Chun Lee*
1100-1120	102	Anisotropic Propagation of Surface Acoustic Waves in Tungsten/$LiNbO_3$ Phononic Crystals (Invited Lecture) *Yuan-Hai Yu, Jia-Hong Sun*
1120-1140	66	Acoustic Performance of Layered Metamaterials *Jung-San Chen, Meng-Hang Tsai*
1140-1200	47	Waves Propagation Behavior of a Metamaterial Beam *Chi-Kuang Lin, Hsin-Haou Huang*

Thursday, October 22, 2015 Time: 1010-1220		
MS008 **尼采廳** **Nietzsche**		**Computational Mechanics of Fluid-solid Interaction and its Applications** *Chair: Chien-Kai Wang*
1010-1030	154	Dynamic Two-Way Coupled Simulation of A Rigid Sphere Falling into Free-Surface Flows (Invited Lecture) *Jia-Sheng Chiou, Chung-Yue Wang, Tso-Ren Wu, Chia-Ren Chu*
1030-1050	56	Subgrid Enriched Direct-Forcing Immersed Boundary Method (Invited Lecture) *Jeng-Feng Lin, Shin-Ruei Lin, Fuling Yang, Shang-Hsien Hsieh, Chuin-Shan Chen*
1050-1110	136	Immersed Boundary of Blending Cell: A Unified Approach for Arbitrary Geometric Solid Boundary Immersed in Fluid Flow *Shin-Ruei Lin, Jeng-Feng Lin, Chuin-Shan Chen, Fuling Yang, Shang-Hsien Hsieh*
1110-1130	103	Building Integrated Vortex Induced Vibration Harvesters *Binyet Emmanuel, Chih-Yung Huang, Jen-Yuan (James) Chang*
1130-1150	144	Finite Element Analysis of Finite Deformation Problems for Bio-Polymer Materials *Bo-Sen Chuang, Pin-Jun Chen, Chien-Kai Wang*
1150-1220	37	**Investigation on Aerodynamic Damping of High-rise Buildings under Interference Effects (Keynote Lecture)** *Yuan-Lung Lo, Yong Chul Kim*

Thursday, October 22, 2015 Time: 1010-1200		
MS011 **達文西廳** **da Vinci**		**Study of Granular Media and its Flow with Particle-based Simulations** *Chair: Guo-Jie Jason Gao and Fuling Yang*
1010-1040	139	**The Effect of Cohesive Force On the Granular Mixing (Keynote Lecture)** *Shu-San Hsiau, Shih-Hao Chou, Li-Tsung Sheng, Li-Shin Lu, Shie-Chen Yang*
1040-1100	21	Dynamics and Frictional Behavior of Finite Dry Granular Mass in Avalanche down an Inclined Smooth Reservoir (Invited Lecture) *Yung-Ta Huang, Fuling Yang*
1100-1120	158	A Study of Granular Avalanches Delay Caused by Low Obstacle (Invited Lecture) *Cheng-En Wu, Cheng-Tao Yang, Chi-Hao Lin*
1120-1140	29	Rheological μ-I Relation for Accelerating Dry Granular Flow in a Rotating Drum *Cheng-Chuan Lin, Fuling Yang*
1140-1200	162	DualSphysics (GPU-CPU) Computing Water Waves Propagating through the Structures in 3D Artificial Viscosity Tank *Fang-Cheng Li, Chun-Wei Pao*

Thursday, October 22, 2015 Time: 1010-1140		
MS013-1 **亞歷山大廳** **Alexandria**		**Smart Structural Health Monitoring and Control Systems** *Chair: Shih-Yu Chu and Chi-Chang Lin*
1010-1040	153	**Structural Health Monitoring and Beyond: a Bayesian Approach towards Condition Prognosis (Keynote Lecture)** *Yi-Qing Ni*
1040-1100	88	Stiffness Controllable Mass Damper System with Least Energy Control Method (Invited Lecture) *Shih-Yu Chu, Lyan-Ywan Lu, Shih-Wei Yeh, Chih-Te Chien*
1100-1120	15	Performance Indicators for Control Effectiveness of Tuned Mass Dampers *Ging-Long Lin, Chi-Chang Lin, Lyan-Ywan Lu, Zong-Cyuan Hou*
1120-1140	23	Development and Application of Vibration Isolation System with Adaptive Stiffness Considering Strong Ground Motions *Zheng-Jia Liu, Zhen-Yu Zhan, Tzu-Kang Lin*

Thursday, October 22, 2015 Time: 1010-1140	
MS017 **蘇格拉底廳** **Socrates**	**Computational Biomedicine and Biomechanics** *Chair: Maxim Solovchuk and Tony W.H. Sheu*

1010-1040	142	**Towards the surgical planning platform for the treatment of liver tumor (Keynote Lecture)** *Maxim Solovchuk, Tony W. H. Sheu, Marc Thiriet*
1040-1100	161	Action potential propagation along a myelinated axon (Invited Lecture) *Tzyy-Leng Horng, Min-Jhe Lu, Tai-Chia Lin*
1100-1120	152	Modeling and Simulation of the Interstitial Medium Induced by the Needle Manipulation During Acupuncture (Invited Lecture) *Yannick Deleuze, Marc Thiriet, Tony W.H. Sheu*
1120-1140	150	Simulation Study of the Thermal Effect on the Blood Flow in Chinese Medicine *Chinlong Huang, Tony W. H. Sheu, Peter Deng, Maxim Solovchuk*

Thursday, October 22, 2015 Time: 1320-1450	
MS001-2 **阿基米得廳** **Archimedes**	**Motion Analyses of Solids and Structures by the Vector Form Intrinsic Finite Element (VFIFE) Method** *Chair: Chung-Yue Wang*

1320-1350	151	**Contact Detection of Polyhedral Blocks Using Tetrahedrons (Keynote Lecture)** *Ren-Zuo Wang, Chung-Yue Wang, Hung Lin*
1350-1410	93	Interaction Analyses of Three Dimensional Multiphase Fluids and Flexible Solids (Invited Lecture) *Chung-Yue Wang, Tso-Ren Wu, Chia-Ren Chu , Chih-Jung Huang*
1410-1430	160	Derivation and Verification of VFIFE-DKMT Thick Shell Element *Jiunyan Lee, Ren-Zou Wang, Chung-Yue Wang*
1430-1450	149	Crack Simulation by Vector Form Intrinsic Finite Element (VFIFE) Method *Sumei Wang, Yuanfeng Duan, R. Z. Wang, C. Y. Wang, E. C. Ting*

Thursday, October 22, 2015 Time: 1320-1550	
MS002 **達文西廳** **da Vinci**	**Biomechanical Analysis, Modeling, and Implant Designs** *Chair: Po-Jen Shih and Chang-Wei Huang*

1320-1350	22	**A Corneal Model for Estimation Young's Moduli by Using Ultra-high-speed Scheimpflug Imaging Technology (Keynote Lecture)** *Po-Jen Shih, Chun-Ju Huang, I-Jong Wang, Wen-Pin Shih, Jia-Yush Yen, Huei-Jyun Cao*
1350-1410	89	Patterns of Thermal Deposition in Tissue with an Implant during Ultrasound Diathermy (Invited Lecture) *Chang-Wei Huang, Ming-Kuan Sun, Jay Shieh, Chuin-Shan Chen, Wen-Shiang Chen*
1410-1430	16	The Design of Healing Chamber in Posterior Maxillary Implants *Hsiao-Chien Lee, Pei-I Tsai, Chih-Chieh Huang, San-Yuan Chen, Chuen-Guang Chao, Nien-Ti Tsou*
1430-1450	31	Four-component Pharmacophore Model for Endomorphins *Yng-Ching Wu*
1450-1510	96	The Design of Additive Manufactured Dental Implant *Ming-Jun Li, Hsiao-Chien Lee, Nien-Ti Tsou*
1510-1530	128	Finite Element Analysis of Biomechanics of the Adjacent Segments with Pre-existing Degeneration after Artificial Disc Replacement or Cage Insertion in Degenerative Cervical Disease *Hsuan-Teh Hu, Kuo-Yuan Huang, 徐逸寧*
1530-1550	131	Finite Element Analysis of a Human Cornea subjected to an Eyelid Diaton Tonometer *Kuang-Wu Chou, Chang-Wei Huang, Po-Jen Shih*

Thursday, October 22, 2015 Time: 1320-1510	
MS004-1 **拉斐爾廳** **Rafael**	**Recent Advances in Meshless (Meshfree) Methods** *Chair: Chia-Ming Fan*

1320-1350	138	**Modeling of Slope Stability using Meshfree Method with Fluid-Structure Interaction (Keynote Lecture)** *Pai-Chen Guan, Chien-Ting Sun, Jia-Hong Jiang, On Lei Annie Kwok*
1350-1410	39	Reduction of Numerical Dispersion in Multiquardrics Radial Basis Collocation Method in Solute Transport Simulation (Invited Lecture) *Kuo-Chin Hsu, Sheng-Ming Wu, Der-Liang Young*
1410-1430	3	Numerical Solutions of Transient Groundwater Flow in Heterogeneous Soil Formations Using the Method of Fundamental Solutions (Invited Lecture) *Cheng-Yu Ku, Jing-En Xiao, Chia-Ming Fan, Chih-Yu Liu, Weichung Yeih*
1430-1450	41	Generalized Finite Difference Method for Two-dimensional Transient Free-Surface Flows *Po-Wei Li, Chia-Ming Fan*
1450-1510	13	Strong-Form Framework for Solving Boundary Value Problems With Geometric Nonlinearity *Chu-Yuan Chang , Wan-Ting Su, Judy P. Yang*

Thursday, October 22, 2015 Time: 1320-1430	
MS012-1 **尼采廳** **Nietzsche**	**Advanced Numerical Simulations for Fluid-Structure Interaction** *Chair: Ming-Jyh Chern and Yen-Sen Chen*

1320-1350	14	**FSI Modeling with a Pressure-based Moving Mesh Method (Keynote Lecture)** *Yen-Sen Chen*
1350-1410	26	Coupling Closest Point and Grid Based Particle methods for Interfacial Flows with Insoluble Surfactant (Invited Lecture) *Shih-Hsuan Hsu, Wei-Fan Hu, Ming-Chih Lai*
1410-1430	32	Simulations of Sedimenting Spheres using Immersed Boundary Method *Tzu-Jung Lee, Ting-Yu Lin, Wen-Wei Hsiao, Chuan-Chieh Liao, Chao-An Lin*

Thursday, October 22, 2015 Time: 1320-1450	
MS013-2 **亞歷山大廳** **Alexandria**	**Smart Structural Health Monitoring and Control Systems** *Chair: Lyan-Ywan Lu and Chi-Chang Lin*

1320-1350	74	**Exact H_2 Optimal Solution to Dual-functional Series Electromagnetic Tuned Mass Dampers (Keynote Lecture)** *Yilun Liu, Chi-Chang Lin, Lei Zuo*
1350-1410	52	A Fuzzy Controller for Semi-active Isolation Systems with Variable Stiffness (Invited Lecture) *Lyan-Ywan Lu, Tzu-Kang Lin, Liang-Wei Wang, Shih-Wei Yeh*
1410-1430	104	Comparison of Duffing-Like and Bouc-Wen Models for MR Damper *Hung-Jiun Chi, Yuan-Che Chien, Jia-Ying Tu*
1430-1450	27	Active Control of High-Speed Elevator Systems *Chang-Ching Chang, Chi-Chang Lin*

Thursday, October 22, 2015 Time: 1550-1720	
MS004-2 **拉斐爾廳** **Rafael**	**Recent Advances in Meshless (Meshfree) Methods** *Chair: Judy P. Yang*

1550-1620	45	**Application of Moving Least Square Method for Large Deformation Analysis of Circular Cylindrical Shells (Keynote Lecture)** *Yung-Ming Wang, Tzu-Wei Wu*
1620-1640	33	Applying Smoothed Reproducing Kernel Particle Method for Free-Surface Flow Simulation (Invited Lecture) *Chien-Ting Sun, Pai-Chen Guan*
1640-1700	141	A Systematic Approach for Solving the Torsion Problem of a Circular Bar with Multiple Elliptic Holes *Ying-Te Lee*
1700-1720	12	Reproducing Kernel Collocation Method for Solving Boundary Value Problems with Geometric Nonlinearity *Po-Chun Huang, Judy P. Yang*

Thursday, October 22, 2015 Time: 1550-1720	
MS005-1 **阿基米得廳** **Archimedes**	**Materials Modeling** *Chair: Nien-Ti Tsou*

1550-1620	5	**Mechanical Properties of Single-Walled Aluminosilicate Nanotubes (Keynote Lecture)** *Dun-Yen Kang, Kai-Hsin Liou, Nien-Ti Tsou*
1620-1640	91	Microstructural Characterization from Freeze-Casting Process by Two-Point Correlation Function *Mei-Yi Chen, Tsung-Hui Huang, Tzu-Hsuan Huang, Chuin-Shan Chen*
1640-1700	137	Molecular Dynamics Simulation and Crystal Variant Identification of Shape Memory Alloys *Jo-Fan Wu, Chia-Wei Yang, Nien-Ti Tsou, Chuin-Shan Chen*
1700-1720	156	Modeling of Steric Hindrance and Solution Stability *Liou Crystal, Chen I-An, Huang Hsiang-Yun, Tsou Nien-Ti, Chen Chuin-Shan*

Thursday, October 22, 2015 Time: 1550-1740	
MS010-1 **達文西廳** **da Vinci**	**Structural, Mechanical, and Thermal Properties of Nanomaterials from Atomistic Simulations** *Chair: Wen-Jay Lee and Yu-Chieh Lo*

1550-1620	71	**Atomic-Scale Modeling of the Mechanical and Dielectric Properties of the Ultra-Low-k Nanoporous Organosilicate Hybrid Glasses (Keynote Lecture)** *Tsung-Ju Chen, Sheng-Shin Lin and Chin-Lung Kuo*
1620-1640	49	Mechanical Property and Topography of Graphene-Silicon Heterojunction (Invited Lecture) *Wen-Jay Lee*
1640-1700	87	Thermo-mechanical Behavior of Inhomogeneous Deformation in Bulk Metallic Glasses (Invited Lecture) *Yu-Chieh Lo, Shigenobu Ogata*
1700-1720	78	The Microstructural Evolution In Shape Memory Alloy *Chia-Wei Yang, Nien-Ti Tsou*
1720-1740	164	Geometric Necessary Dislocations and Nanoindentation Size Effects *Kuan-Po Lin, Chi-Hua Yu, Chuin-Shan Chen*

Thursday, October 22, 2015 Time: 1550-1720	
MS012-2 **尼采廳** **Nietzsche**	**Advanced Numerical Simulations for Fluid-Structure Interaction** *Chair: Tzyy-Leng Horn and Ming-Jyh Chern*

1550-1620	72	**On the Efficacy of the Direct Forcing Immersed Boundary Method as Observed in Fluid Structure Interaction (Keynote Lecture)** *Ming-Jyh Chern, Ernest Odhiambo, Tzyy-Leng Horng*
1620-1640	63	Numerical Simulations of Immersed Collision of Tethered Sphrers (Invited Lecture) *Ching-Biao Liao, Cheng-Hsin Chen, Tai-Cheng Lu, Tzyy-Leng Horng, Ming-Jyh Chern*
1640-1700	85	The Developments of Smoothed Particle Hydrodynamics Modeling for Solid-Fluid Interaction (Invited Lecture) *Burniadi Moballa, Ming-Jyh Chern, Symphony Chakraborty*
1700-1720	118	Simulation of Dynamic Process of Parachute Opening Process under a Uniform Airflow *Jen-Pao Su, Jhe-Wei Lin, Jong-Shinn Wu, Wen-Yea Jang*

Thursday, October 22, 2015 Time: 1550-1720	
MS013-3 **亞歷山大廳** **Alexandria**	**Smart Structural Health Monitoring and Control Systems** *Chair: Jer-Fu Wang and Chi-Chang Lin*

1550-1620	53	**Improved Probabilistic Damage Identification of Structures with Uncertainties (Keynote Lecture)** *Ying Lei, Mengxiu Weng*
1620-1640	148	Optimal Design and Performance of Series Multiple Tuned Mass Dampers for Vibration Control of Multi-Story Buildings (Invited Lecture) *Jer-Fu Wang, Chi-Chang Lin*
1640-1700	42	Effect of Pedestrian-Induced Vibration Reduction on Footbridge with Tuned mass dampers *Kuan-Hua Lien, Jing Jhang, Lap-Loi Chung, Yong-An Lai*
1700-1720	92	The New Type of Friction Damper with Multiple Functions *Chia-Shang Chang Chien*

Friday, October 23rd
Technical Program

Time	October 23, 2015					
0830-0910	**Plenary Speech III: Jiun-Shyan (JS) Chen** Chair: Chuin-Shan David Chen Fracture to Damage Multiscale Mechanics and Modeling					
0910-0950	**Plenary Speech IV: Jong-Shinn Wu** Chair: Yen-Sen Chen Progress on Modeling Rarefied Gas Flows Using Unstructured Direct Simulation Monte Carlo Method					
0950-1010	Coffee Break					
1010-1220	MS005-2	MS003-1	MS010-2	MS004-3	MS014-1	MS015-1
1220-1320	Lunch					
1320-1530	MS007-1	MS003-2	MS010-3	MS009-1	MS014-2	
1530-1550	Coffee Break					
1550-1800	MS007-2	MS003-3	MS015-2	MS009-2	MS014-3	
1830-2030	Conference Banquet and Closing Ceremony					

Friday, October 23rd

Plenary Speech (III)
0830-0910 (Socrates 蘇格拉底廳)

Fracture to Damage Multiscale Mechanics and Modeling

Jiun-Shyan (JS) Chen, Edouard Yreux, Mike Hillman

William Prager Chair Professor, Structural Engineering Department
Director, Center for Extreme Events Research
University of California, San Diego (UCSD)

The failure processes in the materials exhibit distinct characteristics depending on the material ductility, the loading rate, and the environmental conditions. The mathematical models and the associated numerical methods for describing the material failure processes can be classified as the discrete description based on fracture mechanics and the continuum phenomenological description based on damage mechanics. This work first discusses how damage mechanics based models can be formulated by the homogenization of fracture models. The challenges in the numerical approximation and discretization of failure modeling based on fracture mechanics and damage mechanics will then be addressed. The mesh dependent issue in the micro-crack informed damage model remedied by the implicit gradient regularization or scaling laws will be presented.

Reproducing Kernel Particle Method (RKPM) is introduced for fracture and damage modeling. RKPM relies on polynomial reproducing conditions to yield desired accuracy and convergence properties, but requires appropriate kernel support coverage of neighboring particles to ensure kernel stability. A new reproducing kernel formulation with “quasi-linear” reproducing conditions is introduced. In this approach, the first order polynomial reproducing conditions are approximately enforced to yield a nonsingular moment matrix. With proper error control of the first order completeness, nearly 2nd order convergence rate in L2 norm can be achieved while maintaining kernel stability. A stabilization scheme for nodal integration is also proposed based on an implicit gradients without the complexity of higher order derivatives for stabilization. Finally, the numerical simulations of various damage processes in extreme events will be given.

Keywords: damage mechanics, fracture mechanics, strain localization, reproducing kernel particle method, extreme events

Friday, October 23rd

Plenary Speech (IV)
0910-0950 (Socrates 蘇格拉底廳)

Progress on Modeling Rarefied Gas Flows Using Unstructured Direct Simulation Monte Carlo Method

Cheng-Chin Su, Ming-Chung Lo, Jong-Shinn Wu, Kun-Chang Tseng

Professor, Department of Mechanical Engineering
Founder, Advanced Rocket Research Center (ARRC)
National Chiao Tung University, Taiwan
ASME Fellow
Associate AIAA Fellow
Chief R&D Officer, GeoSat Aerospace & Technology Inc.

Non-equilibrium rarefied gas dynamics has been playing an important role in many important research disciplines, which include hypersonic reacting flows, vacuum dynamics, micro/nano gas flows, low-pressure materials processing and even recently comet dust/gas jet flows, to name a few. The aforementioned gas flows can be generally modelled using the Boltzmann equation, which is unfortunately very difficult to solve directly using continuum numerical method. Instead, the direct simulation Monte Carlo (DSMC), invented by Prof. G. Bird in early 1960, has been used for solving the Boltzmann equation first based on purely particle collision kinetics. It was later proved mathematically it is equivalent to solving the Boltzmann equation statistically. In this talk, progress of modeling non-equilibrium rarefied gas dynamics using unstructured direct simulation Monte Carlo (DSMC) method is reported. Basic idea of DSMC using structured grid is described first, followed by its extension to unstructured grid. Several advanced algorithms, including variable time-step (VTS) scheme, transient adaptive sub-cell (TAS) method, conservative weighting scheme (CWS), domain re-decomposition, statistical convergence scheme, parallel computing technique using MPI and CUDA, and chemical reaction model based on total collision energy (TCE) concept, are introduced. In addition, further extension to unsteady DSMC and hybrid DSMC-NS scheme are also described. Many realistic and challenging examples will be presented to further demonstrate the capability of unstructured-grid DSMC method.

Keywords: non-equilibrium, rarefied gas dynamics, Boltzmann equation, direct simulation Monte Carlo, parallel computing

Friday, October 23, 2015 Time: 1010-1220	
MS003-1 **亞歷山大廳** **Alexandria**	**Advances in CFD** *Chair: Shu-San Hsiau and Yih-Chin Tai*

1010-1040	40	**Some Modeling Aspects in Simulation of Turbulent Flow Laden with Particles (Keynote Lecture)** *Keh-Chin Chang, Jian-Hung Lin*
1040-1100	105	An Application of Depth-Averaged μ(I)-Rheology to Shallow Flows over General Topography (Invited Lecture) *Ping-Chung Wang, Yih-Chin Tai, Chih-Yu Kuo*
1100-1120	133	Transient Simulation of the Carbon Deposits Reduced by Injected Air Flow in a Coke Oven (Invited Lecture) *Uzu-Kuei Hsu, Keh-Chin Chang, Joo-Guan Hang*
1120-1140	115	An Investigation on Dynamic Behaviors of Metal Fragment under a Detonating Explosive by Using SPH (Invited Lecture) *Cheng-Chiang Hsu*
1140-1200	43	An Euler-Lagrange Model for Simulating Particle Suspension in Liquid Flows (Invited Lecture) *Yi-Ju Chou, Yun-Chuan Shao, Shih-Hung Gu*
1200-1220	28	A pseudo-dry wet contact model for discrete element simulation of immersed particle-wall collisions *Cheng-Chuan Lin, Fuling Yang*

Friday, October 23, 2015 Time: 1010-1140	
MS004-3 **拉斐爾廳** **Rafael**	**Recent Advances in Meshless (Meshfree) Methods** *Chair: Pai-Chen Guan*

1010-1040	140	**Convergence Analysis of Reproducing Kernel Particle Method to Elliptic Eigenvalue Problem (Keynote Lecture)** *Hsin-Yun Hu, Jiun-Shyan (J.S.) Chen*
1040-1100	61	Application of Weighted-least-square Local Polynomial Approximation to 2D Shallow Water Equation Problems (Invited Lecture) *Nan-Jing Wu, Ting-Kuei Tsay, Chieh Chen*
1100-1120	10	A Multiple-scale Polynomial Expansion Method for Solving Nonlinear Elliptic Problems (Invited Lecture) *Chih-Wen Chang*
1120-1140	38	Numerical Investigations of Error in Generalized Finite Difference Method for Second-order Partial Differential Equations *Chia-Ming Fan, Yu-Kai Huang, Pai-Chen Guan, Po-Wei Li*

Friday, October 23, 2015 Time: 1010-1140	
MS005-2 **阿基米得廳** **Archimedes**	**Materials Modeling** *Chair: Nien-Ti Tsou*

1010-1040	86	**Microstructure Modeling of Cubic-orthorhombic Shape Memory alloys (Keynote Lecture)** *You-Yi Lin, Nien-Ti Tsou*
1040-1100	76	A Return-free Integration for Elastoplastic Models *Li-Wei Liu, Chein-Shin Liu, Hong-Ki Hong*
1100-1120	17	Stability and Accuracy of Differential-Algebraic Phase-Field Equations *Tsung-Hui Huang, Tzu-Hsuan Huang, Chuin-Shan Chen*
1120-1140	67	Phase-field Model for Dendritic Solidification in Freeze Casting *Tzu-Hsuan Huang, Tsung-Hui Huang, Chuin-Shan Chen*

Friday, October 23, 2015 Time: 1010-1200	
MS010-2 **達文西廳** **da Vinci**	**Structural, Mechanical, and Thermal Properties of Nanomaterials from Atomistic Simulations** *Chair: Chun-Wei Pao and Chin-Lung Kuo*

1010-1040	35	**What can ab initio calculations do for atomic scale materials? (Keynote Lecture)** *Po-Liang Liu*
1040-1100	97	Dynamic Mechanical Analysis of tire rubber by multi-scale simulations (Invited Lecture) *Chin-Wei Liao, Wen-Dung Hsu*
1100-1120	82	Nanomorphology Evolution of SMDPPEH:PCBM Blend during Solution-Processing and Blade-Coating from Multiscale Molecular Simulation (Invited Lecture) *Cheng-Kuang Lee, Chun-Wei Pao*
1120-1140	145	Multiscale Modeling of Strength and Toughness of 3D IC Intermetallic Microbump *Chi-Hua Yu, Chih-Chun Lin, Chuin-Shan Chen*
1140-1200	24	Non-Reflection Scheme for Atomistic-to-continuum Coupling *Chung-Shuo Lee, Yan-Yu Chen, Chuin-Shan Chen*

Friday, October 23, 2015 Time: 1010-1140	
MS014-1 **尼采廳** **Nietzsche**	**Computational Dynamic Response of Bridge Structures** *Chair: Yu-Chi Sung and Fang-Yao Yeh*

1010-1040	11	**Numerical Analysis of Wind-Induced Structural Response of Bridges (Keynote Lecture)** *Yu-Chi Sung, Yun Chuang*
1040-1100	34	Noise and Vibration Analysis on Track Structures of Embedded Rail System (Invited Lecture) *Fang-Yao Yeh, Yu-Chi Sung, Xiao-Ting Chang, Yu-Hua Chen, Ching-Lin Wang, Chia-Ray Seng*
1100-1120	159	Damage Detection of Beam Structures using Dynamic Macro-strain Measurement and Local Flexibility Method (Invited Lecture) *Ting-Yu Hsu, Wen-I Liao, Shen-Yuan Shiao*
1120-1140	60	Monitoring on Girder-Deflection and Cable-Vibration of Cable-Stayed Bridges *Zheng-Kuan Lee, Chun-Chung Chen*

Friday, October 23, 2015 Time: 1010-1130	
MS015-1 **蘇格拉底廳** **Socrates**	**Computational Mechanics of Advanced Structures and Materials for Engineering Applications** *Chair: Shu-Wei Chang and Tzu-Kang Lin*

1010-1030	19	A Study for Plastic Effect of Steel Structure by AutoDesk Inventor *Ren-Jwo Tsay*
1030-1050	20	Optimization Analysis of the Perforated Heat Sink *Hou-Ren Chen, Yen-Tso Chang, Hung-YI Li, Go-Long Tsai*
1050-1110	120	Molecular Dynamics Simulation of Cementitious Minerals under Indentation *Nai-Hua Yeh, Chi Chen, Yun-Che Wang*
1110-1130	83	Influence of Coverage of Alkanethiolates on Surface Stresses of Au Surface *Yu-Chia Liao, Shu-Wei Chang, Chuin-Shan Chen*

Friday, October 23, 2015 Time: 1320-1530	
MS003-2 **亞歷山大廳** **Alexandria**	**Advances in CFD** *Chair: Yang-Yao Niu and Chien-Chou Tseng*

1320-1350	100	**A New High-order Finite Volume Method For 1D Convection and Diffusion Equations (Keynote Lecture)** *Dartzi Pan*
1350-1410	132	Upwind Space-Time CE/SE Method Applied To Single and Multiple Fluids (Invited Lecture) *Hua Shen, Chih-Yung Wen*
1410-1430	123	Investigations of Empirical Coefficients of Cavitation and Turbulence Models (Invited Lecture) *Chien-Chou Tseng*
1430-1450	50	A Fully Dynamic Multi-Compartmental Poroelastic System: Application to Aqueductal Stenosis (Invited Lecture) *Dean Chou, John C. Vardakis, Liwei, Guo, Yiannis Ventikos*
1450-1510	84	A Geometrical Volume-preserving Technique for Tracking Topology Changes in Immiscible Fluids (Invited Lecture) *Ching-Sen Wu*
1510-1530	107	A Simulation Study of Flow Field in MOCVD Reactor *You-Sian Jhou, Kuan-Cheng Lo, Li-Tsung Sheng, Shih-Hao Chou, Shu-San Hsiau*

Friday, October 23, 2015 Time: 1320-1440	
MS007-1 **阿基米得廳** **Archimedes**	**Complex Fluids** *Chair: Li-Chieh Hsu*

1320-1340	25	Water-Gas and Solid-Gas Interfacial Effects on Surface Nanobubble (Invited Lecture) *Tsu-Hsu Yen, Yeng-Long Cheng*
1340-1400	36	Direct Modelling of Rarefied Quantum Gases in Arbitrary Flow Regimes with Semi-classical Boltzmann-BGK Equation *Manuel A. Diaz, Juan-Chen Huang, Jaw-Yen Yang*
1400-1420	109	Modeling Shear-induced Particle Ordering and Deformation in a Dense Soft Particle Suspension *Chih-Tang Liao, Yi-Fan Wu, Wei Chien, Jung-Ren Huang, Yeng-Long Chen*
1420-1440	80	Lock-on and its Mechanism of Wake Flow behind a Circular Cylinder with a Normal Slit *Huai-Lung Ma, Cheng-Hsiung Kuo*

Friday, October 23, 2015 Time: 1320-1510	
MS009-1 **拉斐爾廳** **Rafael**	**Modeling of Composite Materials, Structures or Systems** *Chair: Yu-Yun Lin and Yun-Che Wang*

1320-1350	155	**Discriminating the Viscoelastic Properties from Flow-Dependent Behavior in Porous Material (Keynote Lecture)** *Yu-Yun Lin, Chen-Hsueh Yang, Ting-Wei Hsu*
1350-1410	124	Low-frequency Viscoelastic Properties of Auxetic Foams under Large Deformation *Yu-Jing Weng, Si-Min Liao, Yun-Che Wang*
1410-1430	127	Viscosity of Liquid Suspensions due to Fluid-structure Interactions for Liquid Pendulum-type Viscoelastic Spectroscopy *Ping Kao, Yun-Che Wang*
1430-1450	129	Structural Dynamics of Steel Frames with Viscoelastic Composite Connectors under Small Deformation *Shang-Jie Huang, Yun-Che Wang*
1450-1510	122	Two-dimensional Phase Field Modeling of Ferroelastic Composite Materials *Meng-Wei Shen, Yun-Che Wang*

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MS010-3 **達文西廳** **da Vinci**	**Structural, Mechanical, and Thermal Properties of Nanomaterials from Atomistic Simulations** *Chair: Cheng-Kuang Lee and Wen-Dung Hsu*

1320-1350	73	**Thermoelectric Figure of Merit of Single-Molecule Junctions: Crossing from Classical to Quantum Mechanical Phonon Transport (Keynote Lecture)** *Ilias Amanatidis, Jing-Yao Kao, Li-Yang Du, Chun-Wei Pao, Yu-Chang Chen*
1350-1410	69	Studying the Shear Deformation of Nanocrystalline Metals Using a Model with Tunable Crystallite Stiffness (Invited Lecture) *Guo-Jie Jason Gao, Yun-Jiang Wang, Shigenobu Ogata*
1410-1430	58	Large-Scale Plastic Deformation Induced by Focused Ion Beam Irradiation (Invited Lecture) *Cheng-Lun Wu, Chun-Wei Pao*
1430-1450	55	An Investigation of Phonon Properties of Graphene and Carbon Nanotubes using Molecular Dynamics Simulations *Pai-Hsun Lee, Yu-Wei Lo, I-ling Chang*
1450-1510	163	Friction Coefficient and Rolling Resistance of a Nanosphere on a Flat Substrate *Chun-Wei Huang, Chi-Hua Yu, Shu-Wei Chang, Chuin-Shan Chen*
1510-1530	98	An Ab-initio Study of Structural, Elastic, Electronic and Thermodynamic Properties of Triclinic Cu7In3 *Ching-Feng Yu, Hsien-Chie Cheng, Wen-Hwa Chen*

Friday, October 23, 2015 Time: 1320-1450		
MS014-2 **尼采廳** **Nietzsche**		**Computational Dynamic Response of Bridge Structures** *Chair: Jong-Dar Yau and Hsiao-Hui Hung*
1320-1350	9	**Decomposition method of Vehicle-Bridge Interaction Dynamics (Keynote Lecture)** *J.D. Yau, S. Urushadze*
1350-1410	121	Track-bridge Interaction of Continuously Welded Rails on Multi-span Railway Bridges of Different Geometric Arrangements (Invited Lecture) *Hsiao-Hui Hung, Yu-Chi Sung, Zheng-Hong Chen, Fang-Yao Yeh, Yu-Hua Chen*
1410-1430	134	Engineering Design Parameter of New RC Bridge Column Subjected to Near-Fault Earthquake (Invited Lecture) *Kuang-Yen Liu*
1430-1450	146	Identification of the Pre-stress Force in Bridge Beams using Their First Natural Frequency *Marco Bonopera, Nerio Tullini, Chun-Chung Chen, Tzu-Kang Lin, Kuo-Chun Chang*

Friday, October 23, 2015 Time: 1550-1750	
MS003-3 **亞歷山大廳** **Alexandria**	**Advances in CFD** *Chair: Yi-Ju Chou and Tzu-I Tseng*

1550-1610	18	Modeling Bidirectional Reflectance Distribution Function of One-dimensional Random Rough Surfaces with the Finite Difference Time Domain Method (Invited Lecture) *Yu-Bin Chen, Min-Jhong Gu*
1610-1630	101	The Development and Application of Parallel Space-Time CE/SE Method on Multiple Graphics Processing Units for Supersonic Flows (Invited Lecture) *Tzu-I Tseng, Fang-An Kuo*
1630-1650	30	A Weighted Least-squares Finite Element Method using Adaptively Refined Meshes for Viscoelastic Fluid Flows (Invited Lecture) *Hsueh-Chen Lee*
1650-1710	110	Development and Verification of a Parallel Direct Simulation Monte Carlo Code (PDSC++) and Its Applications (Invited Lecture) *Cheng-Chin Su, Jong-Shinn Wu, Ming-Chung Lo, Yong-Li Syue*
1710-1730	119	On the Coupling of Multidimensional Gas Discharge and Gas Flow through a Temporal Multiscale Algorithm (Invited Lecture) *B.-R. Gu, C.-C. Chiou, J.-S. Wu*
1730-1750	62	Towards Simple Implicit Preconditioning Riemann Solvers for the Simulation of the Low Mach number Flows *Yang-Yao Niu, Ming Jung Yang*

Friday, October 23, 2015 Time: 1550-1730	
MS007-2 **阿基米得廳** **Archimedes**	**Complex Fluids** *Chair: Ching-Yao Chen*

1550-1610	59	Simulations of Flow past an Inclined Flat Plate with Adaptive Nonconforming Spectral Element Method (Invited Lecture) *Li-Chieh Hsu*
1610-1630	95	Mixing Enhancement by Alternative Radial Injection *Ying-Cheng Huang, Yu-Sheng Huang, Ching-Yao Chen*
1630-1650	116	Ion Inertia Effect in a Capacitively Coupled Plasma *M.-F. Zeng, B.-R. Gu, J.-S. Wu*
1650-1710	117	Plasma Fluid Model Considering Full Ion Momentum Equations *K.-L. Chen, B.-R. Gu, J.-S. Wu*
1710-1730	64	Drop in Ferrofluids Subjected to an Azimuthal Field *Ting-Shiang Lin, Ching-Yao Chen*

Friday, October 23, 2015 Time: 1550-1740	
MS009-2 **拉斐爾廳** **Rafael**	**Modeling of Composite Materials, Structures or Systems** *Chair: Shih-Shan Lin and Yun-Che Wang*

1550-1620	46	**Finite Element Analysis of Adhesively Bonded Composite Single Lap Joints with Non-flat Interfaces (Keynote Lecture)** *Pei-Han Chiu, Shih-Shan Lin, Hsin-Haou Huang*
1620-1640	94	Viscoelastic and Coupled-field Properties of Ferroelastic Composite Materials (Invited Lecture) *Yun-Che Wang*
1640-1700	99	Viscoelastic Properties of Metal-polymer Composites at High Frequencies (Invited Lecture) *Somayeh Bagherinejad Zarandi, Yun-Che Wang*
1700-1720	130	Plastic Energy Dissipation of Composite Beam-column Connectors *Bao Loi Dang, Yun-Che Wang*
1720-1740	125	Molecular Dynamics Simulations of Stress-strain Serrations in Metals and Metallic Glasses *Zong-Han Lin, Nai-Hua Yeh, Yun-Che Wang*

Friday, October 23, 2015 Time: 1550-1700	
MS014-3 **尼采廳** **Nietzsche**	**Computational Dynamic Response of Bridge Structures** *Chair: Chih-Peng Yu and Chang-Wei Huang*

1550-1620	114	**Examination of the Applications of 1-D Continuous Element to the Modeling of Linearly Dynamic Responses of Bridges (Keynote Lecture)** *Chih-Peng Yu, Chia-Chi Cheng, Chih-Hung Chiang*
1620-1640	44	Seismic Assessments for Scoured Bridges with Pile Foundations (Invited Lecture) *Chang-Wei Huang, Hsiao-Hui Hung, Che-Yi Chuang, Kim-Kuo Jeng*
1640-1700	113	Scour Experimental Study of Bridge Health Monitoring based on Hilbert-Huang-Transform *Hsieh-Chan Tsai, Wei-Ting Chou, Tzu-Kang Lin*

Friday, October 23, 2015 Time: 1550-1720	
MS015-2 **達文西廳** **da Vinci**	**Computational Mechanics of Advanced Structures and Materials for Engineering Applications** *Chair: Shu-Wei Chang and Tzu-Kang Lin*

1550-1620	79	**Application of Multifractal Detrended Fluctuation Analysis for Structural Health Monitoring (Keynote Lecture)** *Haikal Fajri, Tzu-Chi Tseng, Tzu-Kang Lin*
1620-1640	75	Multiscale Modelling of Normal and Brittle Bone Collagen: Molecular Origin of Brittle Bone Disease (Invited Lecture) *Shu-Wei Chang, Markus Buehler*
1640-1700	57	An Out-Of-Core Block Lanczos Eigen-Solver with Openmp Parallel Scheme for Large Spare System *Shen-Haw Ju*
1700-1720	112	Predictive Modeling of Piezoresistive Microcantilever Biosensors by Finite Element Analysis and Molecular Dynamics Simulation *Ching-Yu Fan, Tzu-Hsuan Huang, Chuin-Shan Chen, Long-Sun Huang*

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