

# Relay, for a better MRE!

Cite as: *Matter Radiat. Extremes* **9**, 013001 (2024); doi: [10.1063/5.0187709](https://doi.org/10.1063/5.0187709)

Submitted: 15 November 2023 • Accepted: 10 December 2023 •

Published Online: 10 January 2024



View Online



Export Citation



CrossMark

Ke Lan (蓝可)<sup>a)</sup>

## AFFILIATIONS

Institute of Applied Physics and Computational Mathematics, Beijing 100094, China and HEDPS, Center for Applied Physics and Technology, and College of Engineering, Peking University, Beijing 100871, China

<sup>a)</sup> Author to whom correspondence should be addressed: [lan\\_ke@iapcm.ac.cn](mailto:lan_ke@iapcm.ac.cn)

<https://doi.org/10.1063/5.0187709>

After careful consideration, with the consent of Editor-in-Chief Weiyang Zhang (张维岩) and Editor-in-Chief Ho-kwang Mao (毛河光), I have decided to step down as the Executive Editor-in-Chief of MRE to focus on my health and research. I will be succeeded by the next Executive Editor-in-Chief, Professor Jinren Sun (孙今人) of the Shanghai Institute of Laser Plasma, China Academy of Engineering Physics, and Professor Hongbo Cai (蔡洪波) of the Institute of Applied Physics and Computational Mathematics in Beijing. With the help of both of these excellent and experienced physicists, I believe that MRE and its community can be raised to a higher level.

Since I was appointed as the Executive Editor-in-Chief of MRE in 2014 by Editor-in-Chief Weiyang Zhang, I have been associated with MRE for nearly 10 years. These have been a hard and unusual 10 years for MRE. With the strenuous efforts and strong support of the whole community, MRE has leapt from nowhere to being indexed in both Science Citation Index (SCI) and Engineering Index (EI), ranking in Q1 of Physics, Multidisciplinary, with SCIE impact factors of 6.089 in 2021 and 5.1 in 2022, and being selected as one of the most internationally influential academic journals in China.

There is an old saying in China: “The frame is high when the crowd gather firewood.” That is the secret to the rapid growth of MRE. Here, I want to express my special gratitude to Editor-in-Chief Weiyang Zhang (张维岩), Academician of Chinese Academy of Sciences, for his trust in me and his continued strong support. Also, I express my special gratitude to Editor-in-Chief Ho-kwang Mao (毛河光), Academician of the Chinese Academy of Sciences and Fellow of the American Academy of Sciences, a leader of world-class research in high-pressure science and technology at the Center for High Pressure Science and Technology Advanced Research (HPSTAR), for his positioning of MRE in the top level of international physics journals, for his global approach, brilliant editorial ideas, and intelligent strategies to guide MRE, as well as for the significant MRE articles that he has contributed together with his outstanding HPSTAR team. I particularly appreciate Academician Professor Yu Min (于敏), the recipient of the prestigious Chinese State Supreme Science and Technology Award in 2014 and of the

Medal of the Republic of China, who originally named the journal “Matter and Radiation at Extremes.” I warmly thank Dr. Mike Campbell, former Editor-in-Chief of MRE, for all his significant contributions to MRE. I also warmly thank Professor Dr. Dieter Hoffmann (霍迪), who gave MRE its first support from abroad, agreeing to be the International Guest Editor when MRE was still in the planning stage, and who is always ready to back MRE. I greatly appreciate Editor-in-Chief Michel Koenig, for leading the discussions on defining the MRE scope, choosing the top scientists from the community for its board, proposing and organizing the MRE Webinar, inviting the excellent young scientists Robby Scott and Danny Russell to chair the Webinar, and bringing MRE to its current status.

Over the past 10 years, MRE has been very lucky to have been in such excellent hands. I am very grateful to the team of Associate Editors composed of Dr. David Crandall, Dominik Klaus, Kuo Li (李阔), Baifei Shen (沈百飞), Stefan Weber, and former Associate Editors Sergey Lebedev and Bucur Novac, all of whom have been chosen from among the top names in the field of matter and radiation at extremes, for their constant support and for their commitment to their roles of carefully selecting each board member and evaluating their works for MRE one by one, selecting the best articles for MRE from numerous submissions, and devoting themselves to various activities to publicize MRE and attract the best articles to the journal. Of course, within the Editorial team, from time to time, we have also had intense debates about whether a controversial article should be accepted or rejected, or about whose work is more deserving of, for example, the MRE Young Scientist Award. Sometimes, I even felt that there is a world war involving physicists from various countries. However, the interesting thing is that no matter how different the opinions were, the final decisions were always accepted and supported by everyone. I have really appreciated and enjoyed the process. This may be the right way in which MRE can grow in the future.

I give warm thanks to the prestigious Advisory Editorial Board members for contributing brilliant ideas to invigorate MRE to attract the best articles in the field to MRE and increase the impact of MRE

in the community. I deeply appreciate Professor Dr. Kunioki Mima, Caterina Riconda, and Vladimir Tikhonchuk for proposing many interesting hot topics and organizing wonderful special issues for MRE. In particular, I sincerely thank the senior members Manuel Hegelich, Javier Honrubia, and Masakatsu Murakami, who have paid much attention to the development of MRE and have provided firm support since its birth. I greatly appreciate the very active, capable, intelligent, thoughtful, and collaborative staff of the MRE office, namely, Ms. Hao Yang (杨蒿), Ying Huang (黄颖), and Tianhui Li (李天惠), for all their meticulous and excellent work for MRE, and for their planning and organizing the annual International Conference on Matter and Radiation at Extremes (ICMRE), the MRE Editors Meeting, the MRE Young Scientist Award, the MRE Forum and the MRE Webinar, and for managing the MRE Wechat official account. Without them, none of the achievements of MRE would have been possible.

Having a suitable publisher is essential for the success of a journal. MRE was published by Elsevier from 2016 to 2018 before moving to AIP Publishing in 2019. In 2017, before the end of the contract with Elsevier, MRE began to consider a new collaborator. It was Mike Campbell, Stefan Weber, and Riccardo Betti who strongly proposed in 2017 that MRE should collaborate with the American Institute of Physics (AIP) Publishing, a wholly owned not-for-profit subsidiary of AIP, with a high reputation in the physics community. In the Spring of 2018, Hao Yang (杨蒿) and I had our first meeting with Dr. Bridget D'Amelio, Director of Publishing Development of AIP Publishing, in Hangzhou. I was strongly impressed by Bridget's sincerity, dedication, and professionalism. Soon after that meeting, we made the decision for MRE to collaborate with AIP Publishing. The collaboration officially started in 2019. The achievements of MRE in the past 5 years have proved that collaborating with AIPP is one of the best steps that MRE has taken. Wholeheartedly, I sincerely thank a great number of talented and dedicated staff and management at AIP Publishing, including Dr. Jessica Hoy, Alexandra Giglia, John Bogan, and Joseph Castellano for the strenuous efforts they have made with regard to MRE, such as making detailed marketing plans, providing weekly article status reports and quarterly performance reports, organizing the monthly calls to enable the MRE and AIPP Editorial Offices to touch base, actively supporting the bi-monthly MRE Editors Meeting and all MRE activities. In fact, they have provided all the professional support needed by MRE. Without such an excellent collaborator, MRE would not have achieved what it has to date.

I want to take this opportunity to express my sincere appreciation to the Chinese Associate Editors, namely, Academician Jianjun Deng (邓建军), Professor Dr. Yongkun Ding (丁永坤), Professor Dr. Jianguo Wang (王建国), Academician Qiang Wu (吴强), and Professor Baohan Zhang (张保汉) for their strong support, which has meant that MRE is free of page charges, is free for online reading and full-text download, and has taken wholehearted service to science as its philosophy. Also, I want to express my sincere appreciation to all my Chinese colleagues on the current and former Editorial Advisory Board of MRE, namely, Professor Dr. Hongbo Cai (蔡洪波), Jing Chen (陈京), Yaping Dai (戴亚平), Ning Ding (丁宁), Hongliang He (贺红亮), Academician Xiaomian Hu (胡晓棉), Professor Dr. Yongsheng Huang (黄永盛), Shaoen Jiang (江少恩), Jie Liu (刘杰), Wei Lu (鲁巍), Xisheng Luo (罗喜胜), Xiwen Ma (马新文),

Yanming Ma (马琰铭), Yanyun Ma (马燕云), Cheng Ning (宁成), Zhengming Sheng (盛政明), Jian Sun (孙建), Liling Sun (孙力玲), Feilu Wang (王菲鹿), Jian Wu (吴坚), Yuhong Xu (许宇鸿), Xueqing Yan (颜学庆), Tongpu Yu (余同普), Cangtao Zhou (周沧涛), Wanguo Zheng (郑万国), Wenjun Zhu (祝文军), and Academician Guangtian Zou (邹广田), and to all the Guest Editors, namely, Professor Dr. Lihua Cao (曹莉华), Bin Chen (陈斌), Yang Ding (丁阳), Huiyang Gou (缙慧阳), Qingyang Hu (胡清扬), Gang Liu (刘罡), Jin Liu (刘锦), Xujie Lv (吕旭杰), Liang Sun (孙亮), Lin Wang (王霖), Hong Xiao (肖宏), Wenge Yang (杨文革), Qiaoshi Zeng (曾桥石), and Yongtao Zhao (赵永涛). Their great efforts have enabled MRE to rapidly become one of the most internationally influential academic journals in China.

Especially, I want to express my great appreciation to all MRE authors, for their trust in submitting their wonderful articles with exciting results to MRE. I also express my gratitude to all MRE reviewers for their thorough reading of MRE submissions and for providing valuable comments and suggestions. Once and once again, I was touched by the very careful review reports with many interesting questions, suggestions, and comments. I acknowledge all the MRE readers for their downloading, reading, quoting, commenting, criticizing or praising, and publicizing MRE, all of which activities provide an inexhaustible motive force for the whole MRE team. Indeed, it is the enthusiastic encouragement, firm support, and selfless help from the authors, reviewers, and readers that have raised MRE up to such a high level.

Finally, let me express my deep appreciation to all my special friends for their special contributions to MRE. I am grateful to Grant Logan for his important help in improving the first version of the MRE scope. I am grateful to Joseph Nilsen for contributing the first article in MRE on modeling the gain of inner-shell x-ray laser transitions driven by x-ray free electron laser radiation<sup>1</sup> and also for his interesting article on equation-of-state measurement at 100s of mbar in a National Ignition Facility (NIF) hohlraum.<sup>2</sup> I am grateful to Manuel Hegelich and his colleagues for their article on non-Maxwellian electron distributions resulting from direct laser acceleration in near-critical plasmas in the first issue of MRE.<sup>3</sup> Among the contents of the first special issue of MRE (Fig. 1), I acknowledge John Kline and his colleagues for their article on measurements of the mass ablation rate of aluminum completed at the Omega Laser Facility,<sup>4</sup> Javier Honrubia and his colleagues for their article on intense proton beam generation and transport in hollow cones,<sup>5</sup> Masakatsu Murakami and Daiki Nishi for their article on optimization of laser illumination configuration for directly driven inertial confinement fusion,<sup>6</sup> and Mike Campbell and his colleagues for their interesting review and perspective on the laser-direct-drive program.<sup>7</sup> I also thank Vladimir Tikhonchuk, Stefan Weber and their colleagues for their article on the joint experiment at the SG laser facility.<sup>8</sup> Gratefully, I acknowledge the significant support from David Crandall, and I was very glad to hear him say: "I am personally highly interested in inertial fusion and in Inertial Fusion Energy/High Energy Density science, so MRE helps me to stay engaged." Indeed, I have to thank my colleagues for contributing their interesting articles to MRE in the most difficult start-up stage of the journal, and I thank all my friends in China and abroad who always raised me up whenever troubles have come during my past 10 years with MRE. Of course, I also have to say that I am indebted to my husband Junbo Li (李军博) for doing almost all the

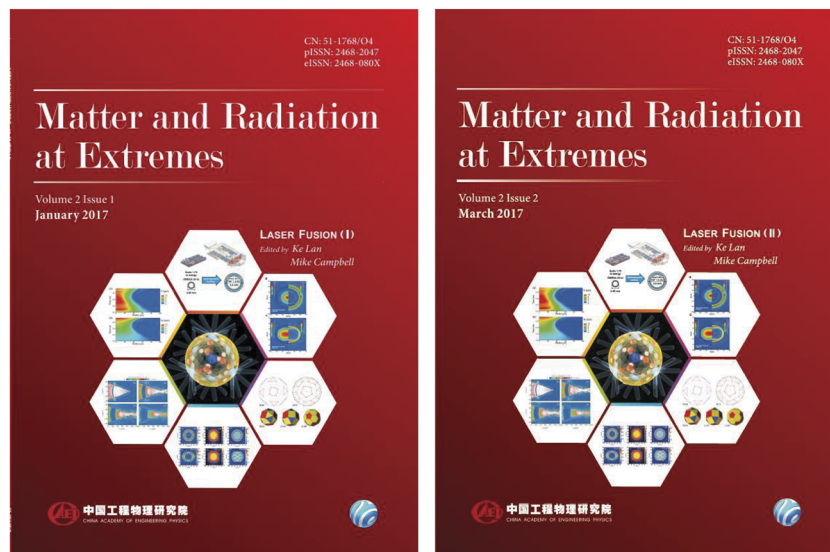


FIG. 1. Cover of the first special issue of MRE on LASER FUSION (I) and (II).

housework over the years so that I can devote almost all my spare time to MRE.

On a personal level, MRE has a special place in my heart. My colleagues and I had published a series of interesting articles on the novel octahedral spherical hohlraum approach for indirect-drive laser fusion,<sup>9–11</sup> and it was in MRE that we subsequently published the first review article<sup>12</sup> and the first perspective article<sup>13</sup> on this novel approach; the first experimental demonstration of improving laser propagation inside the spherical hohlraums by using the cylindrical laser entrance hole;<sup>14</sup> and the first experimental comparisons of laser-plasma interactions (LPI) between the spherical and cylindrical hohlraums.<sup>15</sup> We also published an experimental determination of the laser entrance hole size for an ignition-scale octahedral spherical hohlraum with convincing evidence from multiple diagnostics,<sup>16</sup> which is crucially important for sizing an ignition-scale octahedrally configured laser system. In Ref. 17, published in 2017, we pointed out the non-equilibrium between ions and electrons inside hot spots by analyzing the experimental observations of the National Ignition Facility (NIF) experiments, which is now a hot topic in inertial confinement fusion. More interestingly, based on our analytical studies, we concluded in Ref. 18 that the NIF energy is enough to achieve ignition if a one-dimensional spherical radiation drive can be created and both LPI and hydrodynamic instabilities can be suppressed. Note that Ref. 18 was submitted to MRE in September of 2016 and published online two months later, during the downturn of the NIF ignition. In 2023, with Baifei Shen (沈百飞), we proposed a method for suppressing the stimulated Raman scattering by angularly incoherent light, which paves the way toward the next generation of laser systems for inertial fusion with low LPI by using a super light spring of incoherence in all dimensions of time, space, and angle.<sup>19</sup> Finally, I am very happy that I could organize such an interesting special

issue on laser fusion with Mike Campbell, the first special issue of MRE.<sup>20</sup>

Today, science and technology are advancing in leaps and bounds, with the potential to radically change our understanding of important existing scientific concepts and to lead to totally unexpected discoveries in fields such as Fundamental Physics at Extreme Light, Fusion Physics, Radiation and Hydrodynamics, and High Pressure Physics and Materials Science, which are exactly within the scope of MRE. Here, I want to say, on the way toward novel science in the physics world at extremes, wherever you go, whatever you do, our journal *Matter and Radiation at Extremes* will be right here waiting for you, having the top expert referees for in-depth communication with you and advertising your novel findings in a timely manner to the whole world.

This is not goodbye. I will always be with MRE as a reader and author.

This is a relay! I am delighted to pass the baton to my colleagues Hongbo Cai and Jinren Sun. Looking forward, MRE has not only big challenges but also great opportunities. No matter how, I am confident that MRE will have a bright future.

See the supplementary material for Hongbo Cai and Jinren Sun.

This work is supported by the National Natural Science Foundation of China (Grant No. 12035002).

## AUTHOR DECLARATIONS

### Author Contributions

**Ke Lan (蓝可):** Conceptualization (equal); Writing – original draft (equal); Writing – review & editing (equal).

## REFERENCES

- <sup>1</sup>J. Nilsen, "Modeling the gain of inner-shell X-ray laser transitions in neon, argon, and copper driven by X-ray free electron laser radiation using photo-ionization and photo-excitation processes," *Matter Radiat. Extremes* **1**, 76 (2016).
- <sup>2</sup>J. Nilsen, A. L. Kritcher, M. E. Martin, R. E. Tipton, H. D. Whitley, D. C. Swift, T. Döppner, B. L. Bachmann, A. E. Lazicki, N. B. Kostinski *et al.*, "Understanding the effects of radiative preheat and self-emission from shock heating on equation of state measurement at 100s of Mbar using spherically converging shock waves in a NIF hohlraum," *Matter Radiat. Extremes* **5**, 018401 (2020).
- <sup>3</sup>T. Toncian, C. Wang, E. McCary, A. Meadows, A. V. Arefiev, J. Blakeney, K. Serratto, D. Kuk, C. Chester, R. Roycroft *et al.*, "Non-Maxwellian electron distributions resulting from direct laser acceleration in near-critical plasmas," *Matter Radiat. Extremes* **1**, 82 (2016).
- <sup>4</sup>J. L. Kline and J. D. Hager, "Aluminum X-ray mass-ablation rate measurements," *Matter Radiat. Extremes* **2**, 16 (2016).
- <sup>5</sup>J. J. Honrubia, A. Morace, and M. Murakami, "On intense proton beam generation and transport in hollow cones," *Matter Radiat. Extremes* **2**, 28 (2017).
- <sup>6</sup>M. Murakami and D. Nishi, "Optimization of laser illumination configuration for directly driven inertial confinement fusion," *Matter Radiat. Extremes* **2**, 55 (2017).
- <sup>7</sup>E. M. Campbell, V. N. Goncharov, T. C. Sangster, S. P. Regan, P. B. Radha, R. Betti, J. Myatt, D. H. Froula, M. J. Rosenberg, I. V. Igumenshchev *et al.*, "Laser-direct-drive program: Promise, challenge, and path forward," *Matter Radiat. Extremes* **2**, 37 (2017).
- <sup>8</sup>V. T. Tikhonchuk, T. Gong, N. Jourdain, O. Renner, F. P. Condamine, K. Q. Pan, W. Nazarov, L. Hudec, J. Limpouch, R. Liska *et al.*, "Studies of laser-plasma interaction physics with low-density targets for direct-drive inertial confinement fusion on the Shenguang III prototype," *Matter Radiat. Extremes* **6**, 025902 (2021).
- <sup>9</sup>K. Lan, J. Liu, D. Lai, W. Zheng, and X. He, "High flux symmetry of the spherical hohlraum with octahedral  $\delta$ LEHs at the hohlraum-to-capsule radius ratio of 5.14," *Phys. Plasmas* **21**, 010704 (2014).
- <sup>10</sup>K. Lan, X. He, J. Liu, W. Zheng, and D. Lai, "Octahedral spherical hohlraum and its laser arrangement for inertial fusion," *Phys. Plasmas* **21**, 052704 (2014).
- <sup>11</sup>K. Lan and W. Zheng, "Novel spherical hohlraum with cylindrical laser entrance holes and shields," *Phys. Plasmas* **21**, 090704 (2014).
- <sup>12</sup>K. Lan, J. Liu, Z. Li, X. Xie, W. Huo, Y. Chen, G. Ren, C. Zheng, D. Yang, S. Li *et al.*, "Progress in octahedral spherical hohlraum study," *Matter Radiat. Extremes* **1**, 8 (2016).
- <sup>13</sup>K. Lan, "Dream fusion in octahedral spherical hohlraum," *Matter Radiat. Extremes* **7**, 055701 (2022).
- <sup>14</sup>W. Huo, Z. Li, D. Yang, K. Lan, J. Liu, G. Ren, S. Li, Z. Yang, L. Guo, L. Hou *et al.*, "First demonstration of improving laser propagation inside the spherical hohlraums by using the cylindrical laser entrance hole," *Matter Radiat. Extremes* **1**, 2 (2016).
- <sup>15</sup>Y. Chen, Z. Li, X. Xie, C. Zheng, C. Zhai, L. Hao, D. Yang, W. Y. Huo, G. L. Ren, J. Liu *et al.*, "First experimental comparisons of laser-plasma interactions between spherical and cylindrical hohlraums at SGIII laser facility," *Matter Radiat. Extremes* **2**, 77 (2017).
- <sup>16</sup>Y. H. Chen, Z. Li, H. Cao, K. Pan, S. Li, X. Xie, B. Deng, Q. Wang, Z. Cao, L. Hou *et al.*, "Determination of laser entrance hole size for ignition-scale octahedral spherical hohlraums," *Matter Radiat. Extremes* **7**, 065901 (2022).
- <sup>17</sup>Z. Fan, Y. Liu, B. Liu, C. Yu, K. Lan, and J. Liu, "Non-equilibrium between ions and electrons inside hot spots from National Ignition Facility experiments," *Matter Radiat. Extremes* **2**, 3 (2017).
- <sup>18</sup>G. Ren, J. Liu, W. Huo, and K. Lan, "Analysis of hohlraum energetics of the SG series and the NIF experiments with energy balance model," *Matter Radiat. Extremes* **2**, 22 (2017).
- <sup>19</sup>Y. Guo, X. Zhang, D. Xu, X. Guo, B. Shen, and K. Lan, "Suppression of stimulated Raman scattering by angularly incoherent light, towards a laser system of incoherence in all dimensions of time, space, and angle," *Matter Radiat. Extremes* **8**, 035902 (2023).
- <sup>20</sup>K. Lan and M. Campbell, "Editorial for special issue on laser fusion," *Matter Radiat. Extremes* **2**, 1 (2017).