2025 年 2 月更新

个 人 简 历

<table>
<tr><td colspan="4">（一）基本信息</td><td rowspan="5">  </td></tr>
<tr><td>姓 名</td><td>南文光</td><td>个人主页</td><td>https://nan-group-academic.netlify.app/</td></tr>
<tr><td>工作单位</td><td colspan="2">南京工业大学机械与动力工程学院</td><td>职称 副教授</td></tr>
<tr><td>邮箱</td><td colspan="2">nanwg@njtech.edu.cn</td><td>邮编 211816</td></tr>
<tr><td>地址</td><td colspan="3">江苏省南京市江北新区浦珠南路 30 号</td></tr>
<tr><td colspan="5">（二）研究内容 （颗粒流动力学及应用）</td></tr>
<tr><td colspan="5">1. 研究方向：颗粒多相流动力学；数值模拟（包括 DEM、CFD 等）；人工智能（机器学习）；颗粒/粉体的测量与表征
2. 熟练掌握的软件：1)DEM 部分：EDEM，LIGGGHTS；2）CFD 部分：OpenFoam，Comsol，Fluent；3）编程部分：C++ （独立开发过小型 DEM 代码，现主要基于 EDEM 开发 API)，Fortran，Matlab；4）其他：Solidworks，CP2K
3. 熟练掌握的实验方法：各种试验台搭建、数据采集系统构建、图像后处理和分析等等</td></tr>
<tr><td colspan="5">（三）教育经历</td></tr>
<tr><td colspan="5">1. 2015/10-2016/10，英国利兹大学，颗粒科学与技术研究所，博士，导师：Mojtaba Ghadiri 院士（FREng,CEng,FIChemE，https://ghadiri-group.leeds.ac.uk/）
2. 2011/09-2017/06，西安交通大学，动力工程及多相流国家重点实验室，博士，导师：王跃社教授（郭烈锦院士团队）
3. 2007/09-2011/06，河海大学，热能与动力工程，学士</td></tr>
<tr><td colspan="5">（四）科研与学术工作经历</td></tr>
<tr><td colspan="5">1. 2021/01-至今，英国利兹大学，Virtual Visiting Researcher，Mojtaba Ghadiri 院士
2. 2017/09-至今，南京工业大学，机械与动力工程学院，助理教授/副教授
3. 2018/06-2018/09，英国利兹大学，访问学者，Mojtaba Ghadiri 院士</td></tr>
<tr><td colspan="5">（五）科研项目（课题）情况</td></tr>
<tr><td colspan="5">1. 国家自然科学基金：a) 青年项目，51806099，颗粒形状对颗粒物质流变特性的影响机制研究，2019-01 至 2021-12，26 万元，主持。b) 面上项目，32272358，基于玻璃化转变理论的果粉“分子-颗粒-颗粒群”多尺度吸湿机制研究，2023-01 至 2026-12，54 万元，参与（主持单位为中国农业科学院原子能利用研究所），承担项目 1/4 的研究内容和研究经费：含湿空气环境中单颗粒动力学以及水分在颗粒群中的迁移规律。c) “叶企孙”联合基金项目，U2241248，高强铝合金同轴送粉搅拌摩擦固相增材制造宏/微观组织演变与形性协同调控研</td></tr>
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究（主持单位为西北工业大学），2023-01 至 2026-12，259 万元，参与 1 个子课题的研究内容：颗粒热塑性流动。

2. 国际合作-利兹大学 Mojtaba 院士：a) HP Consultancy, *Single Particle and Bulk Powder Characterisation of Gas-Atomised Metal Powders and Associated Analysis of Roller Spreading by Discrete Element Method*，2018-2021, international collaborator；b) EPSRC Future Formulation Programme, *Virtual Formulation Laboratory for prediction and optimisation of manufacturability of advanced solids based formulations*, EP/N025261/1, 2017-2021, £1.74 Million, participate；c) Engineering Prioritisation Programme, *Modelling, Validation and Application of Triboelectrification*，EP/X023389/1，2023-2026, £1.45 Million, international collaborator.
3. 国家重点研发计划：a) 子课题负责人，2023YFB4606000，移动式复杂现场环境增材制造技术与装备，2023-12 至 2026-11。b) 参与，2022YFB4602200，大型高性能结构件增等减材复合绿色智能制造，2022-12 至 2025-11。

（六）研究特色和实验设备

1. 研究特色：1）基础研究：首次系统性地建立了粘性颗粒材料离散元数值模拟所需颗粒参数（如颗粒形状、粘附表面能、摩擦系数等）的测量和表征方法，弥补了传统研究中反复校正模拟输入参数以匹配休止角等颗粒体流宏观特性的拟标定方法的不足；2）基础研究：基于能量相似的原理，给出了 LEPA 模型中关键参数的计算准则和公式；3）基础研究：采用实际流变仪探究颗粒材料的流变特性，弥补了传统研究中理想简单剪切流或准静态实验等方法的不足，并系统性地建立了复杂流动工况下流变特性的模化方法，包括剪切速率、颗粒形状、气相介质、混合颗粒等对颗粒流变特性的影响机制；4）基础研究：在流变仪中观察到了颗粒材料流动的非局部效应，并利用颗粒温度和惯性数提出了基于表观黏度的流变模型，且建立了模型关键参数与流变仪输出转矩间的经验关系式，完善了不同流态中颗粒物质动力学本构方程；5）基础研究：针对颗粒铺展系统，开展了多项开拓性的研究工作，例如，首次发现了颗粒动态间歇性卡塞现象，建立了临界铺展速度理论预测模型， 基于颗粒间歇性卡塞行为发现了刮板发生磨损的新机制，等等；6）应用研究：将颗粒动力学理论引用到热态条件下螺杆送料问题，揭示了工艺参数对颗粒卡塞和送料流率的影响机制。
2. 自制研究设备和仪器：1）基础研究：颗粒多功能转鼓实验系统，可用于研究颗粒自由流的流变特征，并可测量颗粒的流动性；2）基础研究：单颗粒黏附表面能测量系统，可测量单个颗粒-壁面的黏附力和黏附表面能，含高精度自研附件；3）基础研究：单颗粒吸湿实验系统，可测量颗粒-颗粒在含湿空气环境中搭接和结块动力学行为；4）基础研究：颗粒铺展/卡塞实验系统，可用于研究颗粒在狭小间隙处的卡塞动力学行为，配有相机系统；5）应用研究：颗粒固相增材样机，并配有颗粒动力学实验测量模块。

（七）期刊论文（独立一作/通讯 SCI 论文（JCR 一区）近 30 篇,引用次数逾千次）

[1] **Wenguang Nan***, Wenbin Xuan, Ziming He, Haimeng Hou, Zhonggang Sun, Wenya Li, Analysis of the screw feeding process in powder-based additive friction stir deposition. *Powder Technology*, **2025**, 455: 120791.

URL: https://doi.org/10.1016/j.powtec.2025.120791.

[2] **Wenguang Nan***, Lanzhou Ge, Ziming He, Zhonggang Sun, Jinzhong Lu. Powder spreading and spreadability in powder-based additive manufacturing: State of the art and perspectives. *Powder Technology,* **2025**, 449: 120393. URL: https://doi.org/10.1016/j.powtec.2024.120393

[3] Wenbin Xuan, **Wenguang Nan***. Analysis on the mechanical jamming of particle flow using impeller-based rheometer. *Powder Technology,* **2024**, 444: 120003.

URL: https://doi.org/10.1016/j.powtec.2024.120003

[4] Yulun Xu, **Wenguang Nan***, Zhonggang Sun. Ab initio simulation of the dynamic shock response of single crystal and lightweight multicomponent alloy. *Computational Materials Science,* **2024**, 244: 113268.

URL: https://doi.org/10.1016/j.commatsci.2024.113268

[5] Yulun Xu, Lanzhou Ge, **Wenguang Nan***. Investigation on the spreading behaviour of sand powder used in binder jet 3D printing. *Granular Matter*, **2024**, 26: 49. *Invited paper*

URL: https://doi.org/10.1007/s10035-024-01420-8

[6] **Wenguang Nan**, Mehrdad Pasha, Umair Zafar, Sadegh Nadimi, Wei Pin Goh, Mojtaba Ghadiri*. Characterisation of gas-atomised metal powders used in binder jet 3D printing. *Powder Technology*, **2024**, 436: 119471.

URL: https://doi.org/10.1016/j.powtec.2024.119471

[7] **Wenguang Nan***, Lanzhou Ge, Wenbin Xuan, Yiqing Gu. Transient jamming of granular flow by blade spreading. *Powder Technology*, **2024**, 431: 119057. URL: https://doi.org/10.1016/j.powtec.2023.119057

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[9] Rui Xu, **Wenguang Nan***. Analysis of the metrics and mechanism of powder spreadability in powder-based additive manufacturing. *Additive Manufacturing*, **2023**, 71: 103596.

URL: https://doi.org/10.1016/j.addma.2023.103596

[10] **Wenguang Nan***, Arifur Rahman Md, Lanzhou Ge, Zhonggang Sun. Effect of plastic deformation on the spreadability of cohesive powder in the spreading process. *Powder Technology*, **2023**, 425: 118577.

URL: https://doi.org/10.1016/j.powtec.2023.118577

[11] Ming Zhu, **Wenguang Nan***, Yueshe Wang. Analysis on the thermal behaviour of the latent heat storage system using S-CO2 and H-PCM. *Renewable Energy*, **2023**, 208: 240-50.

URL: https://doi.org/10.1016/j.renene.2023.03.041

[12] **Wenguang Nan***, Wei Pin Goh, Tarequr Mohammad Rahman. Elasto-plastic and adhesive contact: An improved linear model and its application. *Powder Technology*, **2022**, 407: 117634.

URL: https://doi.org/10.1016/j.powtec.2022.117634

[13] **Wenguang Nan***, Yiqing Gu. Experimental investigation on the spreadability of cohesive and frictional powder. *Advanced Powder Technology*, **2022**, 33:103466. URL: https://doi.org/10.1016/j.apt.2022.103466

[14] **Wenguang Nan**, Mehrdad Pasha, Mojtaba Ghadiri*. Rheology of a dense granular bed penetrated by a rotating impeller. *Powder Technology*, **2021**, 386: 60-69. URL: https://doi.org/10.1016/j.powtec.2021.03.029

[15] **Wenguang Nan***, Yiqing Gu. Stress analysis of blade rheometry by DEM simulations. *Powder Technology*, **2020**, 376: 332-341. URL: https://doi.org/10.1016/j.powtec.2020.08.026

[16] **Wenguang Nan**, Mehrdad Pasha, Mojtaba Ghadiri*. Effect of gas-particle interaction on roller spreading process

in additive manufacturing. *Powder Technology*, **2020**, 372: 466-476.

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[17] Moustafa Ahmed, Mehrdad Pasha, **Wenguang Nan**, Mojtaba Ghadiri*. A simple method for assessing powder spreadability for additive manufacturing. *Powder Technology*, **2020**, 367: 671-679.

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[18] **Wenguang Nan**, Mehrdad Pasha, Mojtaba Ghadiri*. Numerical simulation of particle flow and segregation during roller spreading process in additive manufacturing. *Powder Technology*, **2020**, 364: 811-821.

URL: https://doi.org/10.1016/j.powtec.2019.12.023

[19] Mojtaba Ghadiri*, Mehrdad Pasha, **Wenguang Nan**, Colin Hare, Vincenzino Vivacqua, Umair Zafar, Saeid Nezamabadi, Alejandro Lopez, Massih Pasha, Sadegh Nadimi. Cohesive powder flow: Trends and challenges in characterisation and analysis. *KONA Powder and Particle Journal*, **2020**, 37: 3-18.

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[22] **Wenguang Nan**, Mehrdad Pasha, Tina Bonakdar, Alejandro Lopez, Umair Zafar, Sadegh Nadimi, Mojtaba Ghadiri*. Jamming during particle spreading in additive manufacturing. *Powder Technology*, **2018**, 338: 253-262. URL: https://doi.org/10.1016/j.powtec.2018.07.030

[23] **Wenguang Nan**, Mojtaba Ghadiri*, Yueshe Wang. Analysis of powder rheometry of FT4: Effect of particle shape. *Chemical Engineering Science*, **2017**, 173: 374-383. URL: https://doi.org/10.1016/j.ces.2017.08.004

[24] **Wenguang Nan**, Mojtaba Ghadiri*, Yueshe Wang. Analysis of powder rheometry of FT4: Effect of air flow. *Chemical Engineering Science*, **2017**, 162: 141-151. URL: https://doi.org/10.1016/j.ces.2017.01.002

[25] **Wenguang Nan**, Vincenzino Vivacqua, Mojtaba Ghadiri*, Yueshe Wang. Numerical analysis of air effect on the powder flow dynamics in the FT4 powder rheometer. *EPJ Web of Conferences*, **2017**, 140: 03036.

URL: https://doi.org/10.1051/epjconf/201714003036

[26] Fabio Fulchini, **Wenguang Nan**, Mojtaba Ghadiri*, et al. CFD-DEM Analysis of Particle Attrition in a Jet in a Fluidised Bed. *EPJ Web of Conferences*, **2017**, 140: 07017. URL: https://doi.org/10.1051/epjconf/201714007017

[27] **Wenguang Nan**, Yueshe Wang*, Jianzhong Wang. Numerical analysis on the fluidization dynamics of rodlike particles. *Advanced Powder Technology*, **2016**, 27: 2265-2276. URL: https://doi.org/10.1016/j.apt.2016.08.015

[28] **Wenguang Nan**, Yueshe Wang*, Huiping Tang. A viscoelastic model for flexible fibers with material damping. *Powder Technology*, **2015**, 276: 175-182. URL: https://doi.org/10.1016/j.powtec.2015.02.037

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（八）发明专利

[1] **南文光**，何子明，孙中刚，CN202411491755.6

[2] **南文光**，刘中旭，CN202411322998.7

[3] **南文光**，王苏情，周志博，CN202411234964.2

[4] **南文光**，周志博，王苏情，CN202411010815.8

[5] **南文光**，轩文彬，刘中旭, 何子明，孙中刚， 葛兰洲，许玉伦，CN202410936641.1

[6] **南文光**，刘中旭，李德格，CN202410920623.4

[7] **南文光，**轩文彬，何子明，孙中刚，葛兰洲，CN202410815307.0
[8] **南文光，**刘中旭，葛兰洲，许耀辉，CN202311624946.0
[9] **南文光，**徐蕊，葛兰洲，顾益青，CN2023 10366801.9
[10] **南文光，** 顾益青，CN202011185854.3