

# Welcome

Xin Shi

14 July 2025

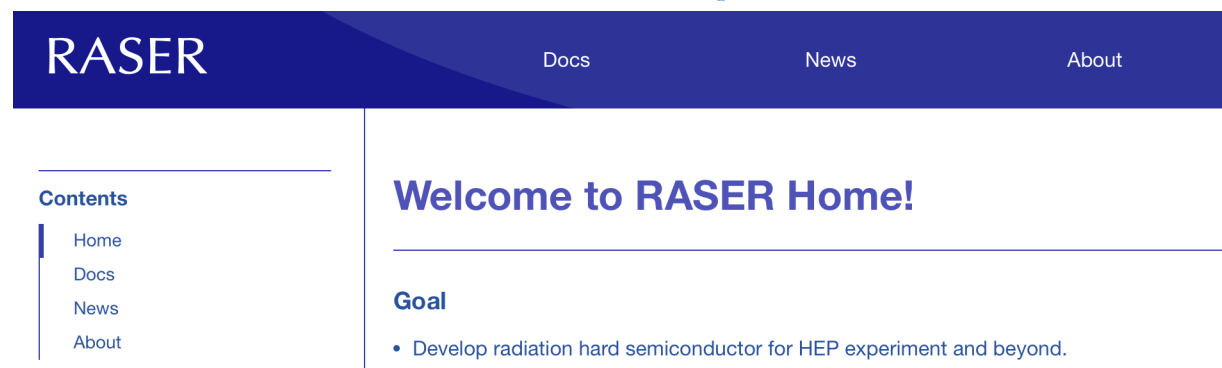
# RASER 团队简介

- 团队目标： 研发用于高能物理及其他领域的抗辐照半导体探测器
- 正式成立： 2022.11.14
- 成员单位： 高能所、吉林大学、山东高研院、辽宁大学、兰州大学、南京大学、大连理工大学、中山大学、上海科技大学、西北工业大学、山东大学等
  - 来自全国的**本科生**是重要的组成部分!

<https://raser.team>

## • 主体架构

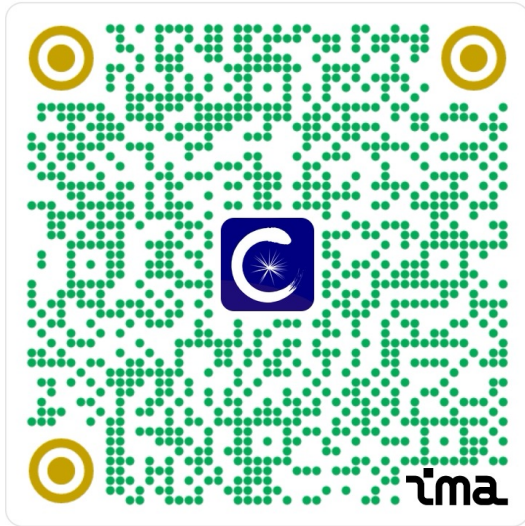
- RASER / 器件与探测器仿真程序
- SICAR / 碳化硅器件研制
- TRACK / 触发与数据获取系统



# RASER Workshop - 2025

- RASER Workshop 2025 (7.14-7.16)  
<https://indico.ihep.ac.cn/event/25833/>
- Day 1
  - Welcome – Xin Shi
  - Overview – Xingcheng Li
  - Computing Basics – Chenxi Fu
- Day 2
  - RASER Program Overview – Suyu Xiao
  - Electrical Simulation – Lin Zhu
  - Signal Generation Simulation – Chenxi Fu
- Day 3
  - TCT – Lin Zhu
  - CLFM – Yanpeng Li
  - Strip – Chenxi

# IMA : raser-note



问知识库

**raser-note**  
史欣 | 68个内容

RASER NOTE

内容

- SiC  
2个项目 08/26
- 探测器测试  
1个项目 05/29
- 探测器设计  
22个项目 05/29
- 软件设计  
43个项目 05/27

没有更多内容了

如何设计 3D 探测器

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找到了24篇知识库资料作为参考

思考过程 (用时6秒)

根据提供的文档内容，我将针对问题“如何设计3D探测器”进行回答。首先需要从文档中查找与3D探测器设计相关的信息。

在《2025.6.8\_ChenxiFu\_RASER.pptx》中提到，RASER软件的未来发展方向包括扩展到3D探测器（见“Next steps”部分）。此外，在《CSC1-C.md》中提到了“3D型像素探测器”和“DTI+深阱+保护电极隔离”的设计框架。在《devsim\_3D.md》中详细讨论了DEVSIM 3D基础框架的实现，包括三维器件的有限元限制、多电极问题、异质结器件开发以及位错缺陷的引入。这些内容涉及3D探测器的电学性能仿真和设计验证。

另外，《Graphene\_SiC.md》中提到了环电极的电场分布问题，虽然主要针对PIN探测器，但

内容 > SiC



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Exploring the design and measurements of next-generation 4H-SiC LGADs  
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TCT  
Wide-bandgap semiconductor  
Ionizing radiation detector

ABSTRACT

This contribution presents the design, production, and initial testing of newly developed 4H-SiC Low Gain Avalanche Detectors (LGADs). The evaluation includes performance metrics such as the internal gain layer's efficiency in enhancing signal generation, initial laboratory and Transient Current Technique (TCT) measurements provide insight into the device's stability and response to the signal.

Due to the increase of availability provided by the industry, 4H-SiC is emerging as a strong candidate for the next generation of semiconductor detectors. Such progress is promising due to the inherent radiation tolerance of 4H-SiC and its stable operation across a wide temperature range. However, due to the wider bandgap of 4H-SiC compared to standard silicon, and difficulty to produce high-quality layers thicker than 50 μm, an internal charge multiplication layer needs to be introduced.

The presented 4H-SiC LGADs, fabricated by means, are optimized for an N-type substrate-type wafer. The initial TCT and laboratory test results demonstrate fast charge collection and uniform multiplication across multiple samples produced on a single wafer.

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思考过程 (用时5秒)

嗯，用户要求我总结一篇关于4H-SiC LGAD探测器的学术论文的主要内容，需要尽可能详细。这是一篇发表在《Nuclear Inst. and Methods in Physics Research, A》期刊上的技术论文。

从论文标题和摘要来看，核心内容是研究新型碳化硅低增益雪崩探测器（LGAD）的设计、制造和性能测试。这类探测器主要面向高能物理实验等辐射环境苛刻的应用场景。

让我先梳理论文的整体结构：引言部分阐述了研究背景和动机，设计制造部分说明器件结构，实验方法部分描述测试手段，结果部分展示电学特性、TCT测试和β源测试数据，最后是结论和致谢。

具体到内容要点：作者团队使用onsemi提供的6英寸4H-SiC晶圆，通过离子注入技术制造了三种器件（标准PN结和两种不同增益层的LGAD）。核心创新点在于在宽禁带半导体上实现类似硅基LGAD的增益结构，这能解决碳化硅固