

# Announcing the **Quantum New Mexico** (QNM) Institute

QNM-I



# Joint Partnership between SNL Academic Programs and UNM CQuIC

Sandia Team Lead

Setso Metodi

Manager | Quantum Computer Science

UNM Team Lead

## Ivan Deutsch

Regents' Professor | Physics & Astronomy Director | CQuIC

**Objective:** Develop a world-class research institute that builds on the historically strong SNL-UNM QIS foundation:

- Expand research & development in QIS technologies
- Support education, training, and workforce development
- Foster the creation of multi-institution research centers
- Build a stronger scientific foundation that integrates key aspects of QIS
- Meet the nation's economic and national security goals in QIS

## Why: QNM Institute will raise our national profile

• QIS is among the top priorities for US S&T Investment, and further opportunities for funding are arising. We have a common interest in remaining completive in this field.

**How:** Leverage our existing collaborations and model QNM-I after successful joint quantum centers: CU Boulder/ NIST partnership (JILA) & UMD/ NIST Partnership (JQI)

## A Strong UNM/SNL Partnership



2005
UNM helps
Sandia launch its
QIS program
Short Course in QI



### Joint UNM/SNL research in QIS



- LDRD 2010 Grand Challenge: AQUARIUS
- Multiple **Current** AA LDRD contracts and other funded projects:
  - T. Albash (UNM/ECE) & A. Baczewski (SNL, 1425)
  - V. Acosta (UNM/CHTM) & J. Henshaw et. al (SNL, 1882)
  - I. H. Deutsch (UNM/Physics) & Y.-Y. Jau (SNL, 5228)
  - D. Kapur (UNM/CS) & W. Witzel and M. Sarovar (SNL, 1425, 8739)
  - J. Plusquellic and E. Tsiropoulou (UNM/ECE) & D. Stick and D. Lobser (SNL, 5225)
  - 2020 Capstone: UNM part of \$115M NQI/QSA Center led by LBNL & SNL
  - Quantum Summer School (Jake Douglas, Megan Ivory)



### • Sandia Adjuncts and Research Faculty supervise dissertation research in QIS

M. Brickson (Baczewski); T. Scholten (Blume-Kohout); A. Hankin, A. Orozco, A. Rakholia; (Biedermann); M. Curry (Carroll); J. Anderson, C. Cesare, B. Chase, B. Morrison, C. Ryan-Anderson (Landahl); Chow(Jau/Clark); J. Bainbridge, K. Campbell (Schwindt); B. Tabakov (Stick)

Sandia Support for joint QIS activities:

Southwest Quantum Information and Technology (SQuInT)



## Key Elements to Success

## NM Partnerships

Creation of Prestigious postdoctoral fellowships and student research assistantships

Students and Postdocs



QNM faculty fellowships via Sandia's Faculty Loan Joint Appointment program (FLJA).

Well-maintained website, marketing strategy, and strong communications & outreach team to maintain visibility.

Admin and Marketing QNM-I

Physical Space External space for QNM students, postdocs, faculty fellows, and visitors will allow for flexibility to host long-term visitors and international students

Engaged business management and grant support team to help pursue large multi-institutional research centers.

Business and Grants





## QNM-I: People and Governance

## NM Partnerships

The QNM-I will be governed under a joint agreement of a MOU to be agreed upon between SNL and UNM. Draft structure is proposed here:

#### **Oversight Board**

SNL head of Academic Programs or designate
SNL Chief Research Officer or designate
UNM Special Assistant to the Provost for
Laboratory Relations or designate
UNM Vice President for Research or designate

Overseas operations; Substantial issues facing the QNM Institute; Budget and allocation

#### **Executive Committee**

Co-Director (SNL, UNM)
Assistant co-Director (SNL, UNM)
Industrial Affairs and Economic
Development Director (SNL, UNM)

Day-to-day operations of QNM-I

#### **QNM Fellows**

Faculty at UNM and staff scientists & engineers at SNL

Scientific Direction; furtherance of goals; carrying out of work

All responsible parties, relationships, and collaborations will be represented on our website once it's created.

Key Point: Each institution will be represented equally across all governance structures

# QNM-I: Next Steps, Involvement

## NM Partnerships

#### **Detailed Institution Proposals:**

- Needs and costs
- Desired accomplishments
- Checkpoints
- Governance Structure

Begin joint faculty appointments under the QNM-I.

A well-established industrial partnership.

Broaden QNM Partnerships with other New Mexico Institutions and establish dedicated physical space

Year 1 (FY22-FY23)

First Five Years

First Decade

Establish Staff fellowships
Establish faculty loan program
Initiate student/postdoc positions
Staff and establish administrative
support and infrastructure

Growing External Funding, including at least one large QNM-I research center grant: e.g., NSF STV

Awarded around \$100M in research funding over 10 years.

Get Involved: contact us: Setso (tsmetod@sandia.gov) or Ivan (ideutsch@unm.edu)