## **Modular Computation versus Quantum Computation**

Modular computation will re-shape the way modern computation is performed. Modular Computation is significantly more practical and relevant for meeting actual demands of the 21st century:

| Applications / Capability                                      | Modular computation | Quantum computation |
|--|---------------------|---------------------|
| Performs Quantum Applications?                                 | 8                   | <b>✓</b>            |
| Solves certain types of intractable problems involving graphs? | 8                   |                     |
| Other Quantum computations and applications?                   | 8                   |                     |
| Quantum cryptography ?   | 8                   | Maybe in future     |
| Supports Conventional Cryptography?                            | <b>✓</b>            | 8                   |
| RSA  |                     | 8                   |
| Elliptical Curve   | <b>✓</b>            | 8                   |
| Performs Digital Arithmetic?                                   | $\checkmark$        | 8                   |
| Performs deep neural network processing?                       | <b>✓</b>            | 8                   |
| Performs highly accurate matrix multiplication?                | <b>✓</b>            | 8                   |
| Performs digital signal processing?                            | <b>√</b>            | 8                   |
| Can leverage digital computer algorithms and programs?         | <b>✓</b>            | 8                   |
| Technology / Implementation                                    | <b>✓</b>            | 8                   |
| Can use conventional IC technology?                            | <b>✓</b>            | 8                   |
| Can be implemented using ASIC?                                 | <b>✓</b>            | 8                   |
| Can be implemented using FPGA?                                 | ✓                   | 8                   |
| Can be implemented using custom IC?                            | <b>✓</b>            | Highly custom       |
| Is a mature architecture?                                      | 8                   | 8                   |
| Packaging and Logistics  | <b>√</b>            | 8                   |
| Requires super-cooling?  | 8                   | <b>✓</b>            |
| Small form factor?   | <b>√</b>            | 8                   |
| Can take advantage of 3-D IC technology?                       | <b>✓</b>            | 8                   |
| Can take advantage of newest IC Technologies in production?    | $\checkmark$        | 8                   |
| Can take advantage of latest digital IC Technologies in R&D?   | ✓                   | 8                   |
| Modular computing can be integrated into Quantum computing?    | $\checkmark$        | $\checkmark$        |
| Timeframe for serious deployment                               | 2-3 years           | Unknown             |
| Present funding level  | <b>\$0</b>          | >\$500 million      |