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1. What is meant by a URO?

Broadly speaking, a "university research organization" or "URO" is an internal or external entity that undertakes research projects in affiliation with a university under circumstances distinguishable from those that generally apply within that university. For example, such distinguishing circumstances may include U.S. citizenship restrictions for research participants, the performance of classified or potentially classified research projects, and/or the performance of research funded through mechanisms (such as Federal earmarks) that do not involve open competition and merit-based review.

2. Is there a "traditional" form of URO?

Some very famous URO's were started by major research universities and eventually became free-standing, legally independent corporations.

One example would be Draper Laboratory\(^1\), which became independent of MIT in 1973. Draper Laboratory advertises its role in calculating Apollo Project trajectories:

"The engineers at the MIT Instrumentation Laboratory, which later became Draper Laboratory, were responsible for designing the Guidance, Navigation and Control system for the Apollo program, including the Apollo Guidance Computer — one of the first applications of the integrated circuit. As the nation celebrates the 40th Anniversary of Man landing on the Moon, Draper celebrates our own engineering accomplishments that, in-part, enabled the success of the Apollo missions, and paved the way for Draper's continued role in modern space flight."\(^2\)

Draper Laboratory clearly exemplifies the common, dual (national security and civilian) use of URO expertise. The organization openly acknowledges the current military role of its continuing guidance, navigation, and control expertise:

"Draper is applying its guidance, navigation, and control (GN&C) expertise to maintain and modernize Navy and Air Force strategic missile guidance capabilities."\(^3\)

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\(^1\) [http://www.draper.com/](http://www.draper.com/)
\(^2\) [http://www.draper.com/Apollo/index.html](http://www.draper.com/Apollo/index.html)
\(^3\) [http://www.draper.com/strategic/strategic.html](http://www.draper.com/strategic/strategic.html)
Other “eventually independent” URO’s include Altarum Institute (which sprang from the University of Michigan) and SRI International (which spun out of Stanford University).

Altarum began its existence as the Willow Run Laboratory in 1946, to provide “contract research to support defense and intelligence agencies of U.S. government”. It was renamed the Environmental Research Institute of Michigan in 1972 and Altarum Institute in 2001. Over the course of its existence, its focus has shifted from radar, to satellite imagery, to environmental research, to health care.

According to its website,

“SRI International was founded as Stanford Research Institute in 1946 by the trustees of Stanford University. The institute’s establishment followed several decades of cooperation between members of the Stanford community and U.S. West Coast business executives. SRI became independent of the university in 1970, and changed its name to SRI International in 1977.”

Among its many accomplishments, SRI states that it “identified Anaheim, California, as the site for Disneyland” in 1953 and “created intelligence systems for the war against terrorism” in the last decade.

Generally, these independent, long established URO’s have remained fiscally healthy for decades. For example, in 2008, SRI International’s consolidated revenues were approximately $490 M, of which 59% derived from DoD. Altarum Institute is much smaller; it reported $43.1 M in revenue in the same year, its first focused solely on health care. According to their websites, SRI International currently has approximately 1,600 employees and Draper Laboratory 1,384 employees, from which the cash flow of the latter may be estimated by comparison.

3. Have all “traditional” URO’s become independent of their universities?

No. Two important counterexamples are the University of Texas / Austin’s Applied Research Labs and the Johns Hopkins University’s Applied Physics Labs.

At the University of Texas, the War Research Laboratory (Army focused; established 1942) and the Defense Research Laboratory (Navy focused; established 1945) were merged in 1964 and renamed the Applied Research Labs in 1968. They are now

http://www.sri.com/about/facts.html#history.
http://wwwext.arlut.utexas.edu/.
http://www.jhuapl.edu/aboutapl/default.asp.
headquartered on the J. J. Pickle Research campus, ten miles from the main UT/Austin campus.

The Johns Hopkins University Applied Physics Laboratory started in 1942. Today, it is "a division" of JHU with 4,500 employees, located on a separate 399-acre campus with 20 buildings. It serves "primarily Department of Defense, Department of Homeland Security, NASA, and NSA sponsors".

4. Why didn't MSU start a "traditional" URO in the 1940's, when other institutions were doing so?

We only shifted from being "Michigan Agricultural College" to "Michigan State College of Agriculture and Applied Science" in 1941. Although the research base of the institution that is now MSU was beginning to grow then, the requisite strength for a plausible URO remained well in the future.

5. What other forms of URO exist?

The most common recent (1996) creation is a University Affiliated Research Center, or "UARC". An important difference between UARC's and other related entities is that UARCS are Federally established entities that receive sole source funding under the provisions of 10 USC 2304(c)(3)(B),

"to establish or maintain an essential engineering, research, or development capability to be provided by an educational or other nonprofit institution or a federally funded research and development center....".

UARCs and their sponsoring Federal sponsors include:

- UCSB – Institute for Collaborative Biotechnologies (Army)
- USC – Institute for Creative Technologies (Army)
- Georgia Tech – Georgia Tech Research Institute (Army)
- MIT – Institute for Soldier Nanotechnologies (Army)
- UT / Austin – Institute for Advanced Technology (Army)
- Utah State – Space Dynamics Laboratory (Missile Defense Agency)
- Johns Hopkins University – Applied Physics Laboratory (Navy)
- Penn State – Applied Research Laboratory (Navy)
- UT / Austin – Applied Research Laboratories (Navy)
- U Washington – Applied Physics Laboratory (Navy)
- U of Hawai’i / Manoa – Applied Research Laboratory (Navy)
- UCSC – UARC (NASA)
- U Maryland / College Park – Center for Advanced Study of Language (NSA)
- Stevens Institute of Technology – Systems Engineering Research Center (NSA)
Some consider Federally Funded Research and Development Centers (FFRDC’s) to be another form of URO. FFRDC’s are

“brought into existence at the initiative of a Government agency or bureau to meet some special research or development need which, at the time, cannot be met as effectively by existing in-house or contractor resources.”

An FFRDC need not be affiliated with a university administrative entity, although some of the most famous are. Examples include the Jet Propulsion Laboratory at Cal Tech, the Lincoln Laboratory at MIT, and the Lawrence Berkeley Laboratory at the University of California / Berkeley.

MITRE is an example of a non-university contractor that administers four separate FFRDC’s. On its website, MITRE provides the following descriptive statement:

“Working in the public interest, FFRDCs operate as long-term strategic partners with their sponsoring government agencies. In order to ensure the highest levels of objectivity, FFRDCs are organized as independent entities with limitations and restrictions on their activities. This unique standing permits special access to government information and a long-term perspective. Since FFRDCs are prohibited from manufacturing products, competing with industry, or working for commercial companies, industry and government confidently provide them with sensitive information.”

Over the history of FFRDC existence, the issue of FFRDC competition with the private sector has proven controversial, attracting the attention of the GAO.

6. The UT / Austin entries in the answer to #4 (above) seem to suggest that a university may have more than one UARC, and also that a traditional but non-independent URO may become a recognized UARC.

Yes. It is also worth noting that some UARC’s and FFRDC’s are tightly focused topically, while others are more general.

7. Has 9/11 played a role similar to World War II and the start of the Cold War in catalyzing national security-related research?

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10 http://www.mitre.org/about/ffrdcs.html
Yes, and this time MSU is among the participants. For example, it is interesting to look at new DoD awards to MSU as a function of time, both calendar year-by-year and as a five-calendar year average.

There is a clear change in the MSU five-year average curve at 2001.

8. How has that growth of DoD-funded research at MSU compared with other traditional sources of extramural support to MSU?

The change in the “new Department of Defense awards to MSU” five-year average from the 1997 - 2001 level to 2005 - 2009 (i.e., over eight years) is equivalent to a compounded annual growth rate of 12.78%. For comparison, the equivalent compounded growth rates in five-year averages for new awards were 5.14% at NSF and 6.19% at NIH.

Beyond the single growth figure, however, the differential presence or absence of plateaus makes the various five-year rolling averages illuminating.
9. Do increased levels of DoD and other similar national security-related research (e.g., at the Department of Homeland Security and the Department of Justice) create policy difficulties for MSU?

Yes. The largest issue arises from attempts by funding agency contracting officers to impose publication restrictions on the results of sponsored research at MSU. As approved by academic governance and the Board of Trustees, MSU policy\textsuperscript{11} states:

\textsuperscript{11}\url{http://www.hr.msu.edu/documents/facacdhandbooks/facultyhandbook/sponsoredresearch.htm} -- See #8 in the “Major Guidelines”. 

\[\text{Annual NSF} \quad \text{Annual NIH}\]
"The University should retain for its scholars the right of first publication. The imposition of restriction on publication of research results is incompatible with the basic concept of an educational institution. Exigencies of national defense may at times make exceptions to this policy on publication necessary."

10. Should the current MSU research publication policy be preserved?

It should definitely be preserved, and arguably strengthened, for several reasons. First and foremost, the policy reflects a broad expectation for open inquiry across academe. A pointed example may be found in Stanford University's May 31, 2007 policy entitled "Openness in Research", from which the following key passages are drawn:

"Resolved:

1. That the principle of openness in research - the principle of freedom of access by all interested persons to the underlying data, to the processes, and to the final results of research - is one of overriding importance. Accordingly, it is the decision of the Senate that that principle be implemented to the fullest extent practicable, and that no program of research that requires secrecy (as hereafter defined) be conducted at Stanford University, subject to the exceptions set forth in Paragraph 4 of this Resolution.

2. That a research program shall be regarded as requiring secrecy
   a. if any part of the sponsoring or granting documents that establish the project is not freely publishable, or
   b. if there is a reasonable basis for expectation that any documents to be generated in the course of the research project will be subjected by an outside sponsor to restrictions on publication for a period in excess of that reasonably required (i.e., more than 90 days) for the sponsor to ascertain whether information he or she is entitled to have treated as confidential would be disclosed by publication, or
   c. if access will be required in the course of the project to confidential data so centrally related to the research that a member of the research group who was not privy to the confidential data would be unable to participate fully in all of the intellectually significant portions of the project.

3. That the rules adopted by the Academic Council on September 29, 1967, are hereby amended and, as amended, are reaffirmed:
   a. No research on a thesis or dissertation should be undertaken if, at the time the topic is set, there is any substantial possibility that it will lead to a secret thesis or dissertation.
   b. No secret thesis or dissertation should be accepted as the basis for a degree unless, in the judgment of the Committee on Graduate Studies, the imposition

of secrecy could not reasonably have been foreseen until the work was so far advanced that modification of the thesis topic would have resulted in substantial inequity to the student.

c. Scholarly activities not accessible for scrutiny by the entire Advisory Board should not be considered in connection with appointments, reappointments or promotions.

d. The University should enter no contract and accept no grant to carry out research if the grant or contract restrains the freedom of the University to disclose:
   1. the existence of the contract or grant or
   2. the general nature of the inquiry to be conducted or
   3. the identity of the outside contracting or granting entity, or
   4. the research results;

provided that clause (3) shall not apply either (a) to anonymous gifts or grants that do not call for the performance of specified lines of inquiry, or (b) to research grants or contracts from individuals or non-governmental entities who request anonymity out of a justifiable motivation to protect individual privacy...."

Stanford’s policy is noteworthy for several reasons. First, it was recently re-adopted by the faculty, and is therefore immune to the attack that it is a Vietnam era “relic” not considered post-9/11. Second, it explicitly values inclusiveness in research participation (i.e., research should be conducted without quasi-discrimination based upon citizenship or permanent residency). This reflects the implicit and obvious expectation that Stanford University will attract and engage international scholars in its research programs. Third, it stresses the clear need to protect students’ ability to publish their theses. Fourth, it preserves Stanford’s ability to involve international experts in the evaluation of candidates for promotion and tenure. Fifth, it goes beyond “time of award” contract boilerplate restrictions on research openness and imposes “reasonable expectation” standards to preserve downstream publication rights. Sixth, the policy is easily feasible in its idealism because Stanford exists in a setting where URO’s exist, of which SRI International (discussed in #2, above) is the foremost. All of these points are commendable. The second through fifth points are equally applicable at MSU today, and bolster the case for the retention of the MSU policy quoted earlier.

An additional, extremely important reason to preserve (and strengthen) the policy exists: avoidance of publication restrictions is unconditionally necessary (although not always sufficient) to invoke the “fundamental research exclusion” under the International Traffic in Arms Regulation (ITAR) for military research topics and the Export Administration Regulations (EAR) for “dual use” research topics. (Regarding the latter, it should be noted that the technology controls avoided under the fundamental research exclusion might involve law enforcement, terrorist activity, etc. -- not just military use. Lie detectors and fingerprint recognition are examples of non-military technologies controlled under the EAR.) A faculty member advocating for a different research policy posture may be prepared to assert that he or she would never
feloniously disclose an ITAR or EAR-controlled technology to a non-citizen, non-permanent resident. Yet, a number of other individuals—quite possibly much less sophisticated in their understanding of the applicable export control regulations—are put at risk of very serious violations when controlled projects are accepted; those individuals include undergraduates, graduate students, technicians, janitors, etc.

11. The foregoing discussion suggests that there exist those who would like to pursue funded research activity despite the application of publication restrictions by the sponsors, right?

Yes. Particularly with respect to national security-related topics, a variety of motivations exist. At the personal level, they range from immediate patriotism, to desire for unique or highly special opportunities for personal accomplishment or student learning, to intent to participate in state or regional economic development through related entrepreneurship, to the desire to ensure downstream personnel availability and/or technological capability to meet long-term national needs. At the academic unit level, they include the likelihood of funding to address current fiscal constraints, ranking and accreditation impacts, and impacts on the ability to attract and retain outstanding faculty with related professional interests.

12. So, given the existing MSU open research policy and the compelling rationale for it on one hand and the desire of some sponsors, faculty, and units to pursue publication-restricted research on the other, what is the University doing now?

The first reaction to a proposal or award involving a publication restriction is to seek its removal by the sponsor via negotiation: a sometimes lengthy process. This sometimes succeeds at DoD, due in part to a Reagan-era National Security Decision Directive (NSDD-189)\(^{13}\) that was reaffirmed in 2001 by Dr. Condoleezza Rice\(^{14}\) when she was National Security Advisor under President G. W. Bush, and that was later implemented in a 2008 memorandum by then-Under Secretary of Defense John J. Young\(^{15}\). During the presidential administration transition in 2008-9, significant contract officer "backsliding" seemed to occur. Subsequent issuances\(^{16}\) by DoD officials in President B. Obama's administration indicate that NSDD-189 remains controlling. A broad consensus of those concerned holds that they should. For example, in his March 13, 2009 statement\(^{17}\) to the House Committee on Science & Technology, Lt. Gen. Brent


\(^{14}\) [http://www.fas.org/sgp/bush/cr110101.html](http://www.fas.org/sgp/bush/cr110101.html).


Scowcroft (USAF, Ret.), Co-Chair of the National Academies’ Committee on Science, Security and Prosperity, commented in part:

"To assure that conditions for scientific and technological competitiveness, the committee has recommended that the fundamental research exemption, also known as NSDD 189, should be maintained and properly implemented."

MSU does its part within the national academic community by advocating strenuously that NSDD-189 be followed. Unfortunately, DHS and DoJ have never complied in the way that the Young memorandum and subsequent issuances compelled at DoD.

Other fallback tactics can be pursued when sponsors are obdurate about publication restrictions. In some cases, projects may be legitimately characterized or reformulated as contract training, testing, or fee-for-service provision rather than research. Additionally, the “exigencies” exception in the MSU policy quoted in item #8, above, has been invoked for research that addresses the detection of, or defense against, Improvised Explosive Devices (IEDs). That decision reflects the appalling and growing IED contribution to on-going combat fatalities: 61% in 2009. As shown below, total IED deaths from 1/1/10 through 9/9/10 essentially matched the toll for all of 2009.

![IED Deaths By Year](image)


Unfortunately, the time necessary to “negotiate out” sponsor demands for publication restrictions demoralizes project investigators and CGA personnel alike, and the outcome of negotiation is always uncertain. **MSU cannot control the pace of negotiation with Federal officials.** Worst of all, some at MSU argue that even a successful
negotiation is counter-productive. They fear that such negotiations induce hostility towards MSU and its faculty on the part of sponsor bureaucrats constrained to back down, notwithstanding the University's internal openness principles and Federal expectations under NSDD-189.

As a result, there is a call in some areas – notably the MSU College of Engineering – for establishment of some form of URO, so that interested and qualified faculty and students may routinely and efficiently pursue attractive research opportunities, notwithstanding the existence of publication restrictions.

13. The phrase “some form of URO” suggests that multiple options deserve consideration. What are they?

At least three URO options deserve consideration:

I. Utilization of a legally independent, not-for-profit corporation: specifically MBI International.

II. Creation of a new, UARC-like internal division within MSU.

III. Creation of a new, not-for-profit LLC or corporation, that would be wholly owned, staffed, and operated by MSU.

In the instance of options “II” and “III”, jointly referred to below as “Leonidas”, a question exists regarding the housing of the entity. An on-campus locale would automatically compete with other MSU space needs, and would entail “fencing” (possible literally) a portion of the MSU campus to restrict URO access, e.g. to U.S. citizens and permanent residents, or just U.S. citizens. Such access restriction would be necessary, even for a URO that did not accept classified research, to permit certain potential unclassified projects controlled by ITAR or EAR. Hence, obtaining off-campus space for the URO would be an attractive option, to maintain the campus as an open environment for scholars from all nations. This creates a potential landlord role for the MSU Foundation or one of its subsidiaries under options “II” and “III”.

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18 MBI International is a subsidiary of the MSU Foundation. The two entities are each independently incorporated, not-for-profit corporations.

19 One might easily envision a variant of this option in which a new, independent, not-for-profit corporation would be created (as was the case for other purposes with Michigan Virtual University under President McPherson or the Prima Civitas Foundation and LEAP under President Simon), or in which a different, existing, not-for-profit corporation (such as Midland's Michigan Molecular Institute) would be utilized. Much of the analysis presented for MBI International, both "pro and con", applies unchanged in those variants. A key advantage of MBI and certain other existing candidate entities is their pre-existing status as Federal contractors.
Detailed scenarios – one for Option I, utilizing MBI or a division thereof as the URO, and one for creating "Leonidas" under Option II or III – are presented in companion documents.

14. Do the scenarios include financial projections?

Yes, they include model six-year summary pro formas.

15. How different are the financial models for the options?

To permit some consistency in comparison, the financial models use the same projected growth in URO extramural support, the same fraction of subcontracting, the same fractional expense and subsequent depreciation for equipment, and the same distribution of expenditures across multi-year project lifetimes.

A key difference between the models resides in the very different F&A (or "overhead" or indirect cost) rates employed for MSU and MBI: 52% and 115.62%, respectively.

Other differences include the assumed core cadre staffing levels and the cash flow timing effects associated with Federal reimbursements (for MBI) and F&A returns (for Leonidas).