Research Agreement	The Parties eac
Figur source can be recomplished through use of As X t put (12 Cl tz*) has	technology
structure, as contragations that Between Management and the internal income	vbsenta N-RMI
The Italian National Institute for Research in Nuclear Physics (Istituto	XI.S. that is into
Nazionale di Fisica Nucleare in the following INFN), National Laboratories of	fight somes fur
Frascati (in the following LNF) tax code 84001850589, VAT number.	Onicga-P has
04430461006, headquarters in Enrico Fermi street, n. 40, Frascati (Rome): the	Compacti ight?
Director of Frascati National Laboratories, pursuant to article number 14 of INFN	the RF pulse de
Technology Transfer regulation, is authorised to sign for INFN	neo bluow mit
and related topics. And	accelerator (lui.
the privately-held research and development firm Omega-P R&D, Inc. (hereafter	The Conaborati
Omega-P) whose address is Suite 401, 291 Whitney Avenue, New Haven, CT	nammo z sved
06511 (USA). Onnil bill la noltrog a sylub of prolege TH band-pH as wed-dayles I	for realization c
Hereinafter each individually referred to as a "Party" and collectively as the	that is content
"Parties".	do rol yldizeog
desirables for and 9-agent's CONSIDERING: (Sugaros) and (1-agent)	Surrand-bud
the National Institute for Nuclear Physics (INFN) is the Italian research agency	accumulated to
dedicated to the study of the fundamental constituents of matter and the laws that	decades of res
govern them, under the supervision of the Ministry of Education, Universities and	linko, a significa
Research (MIUR). LNF is the first and the largest among INFN laboratories, with	ano De doneses
large experience in particle accelerator Physics. INFN conducts theoretical and	
experimental research in the fields of subnuclear, nuclear and astroparticle physics.	
Fundamental research in these areas requires the use of cutting-edge technology	
and instruments, developed by the INFN at its own laboratories and in	
collaboration with industries.	

The Parties each have scientific expertise in the area of free-electron laser (FEL)		
technology.		
INFN, already carries on the Scientific Research activity named CompactLight		
XLS, that is intended to extend the wavelength range for a free-electron laser (FEL)	Z selialit edl'	
light source further into the x-ray region than other FELs.	Nazionale di E	
Omega-P has expertise in three technology areas that are crucial to reach	Francett, (in ti	
CompactLight XLS goal. These are: (a) the radio frequency (RF) source itself; (b)	aaaa_aa <b>aca</b> aaa_	
the RF pulse compressor; and (c) the low-loss RF power transmission waveguide	Director of Fras	
that would convey RF power from the source and pulse compressor to the linear	erf yselendae)	
accelerator (linac).		
The Collaboration is established in recognition of the fact that LNF and Omega-P	the privately-he	
have a common interest in the development of the technical design tools necessary	orly (Lagano	
for realization of a high-power Ka-band RF system to drive a portion of the linac	.06511 (USA).	
that is contemplated for the future European light source CompactLight, and	Herolmarker calc	
possibly for other related projects. LNF expects to be responsible for developing a	l'estise?"	
third-harmonic portion of the CompactLight linac, while Omega-P has		
accumulated knowledge, design tools, and equipment over its more than two	ni leroinei str	
decades of research and development towards a millimeter-wave high-energy	dedicated to the	
linac, a significant portion of which may be directly relevant to help support LNF's	govern them 'ur	
research efforts. All will all associated M (M) agreement with box paid and all MA (A)	Roseanch (MRE)	
in particle accolerator Physics. INTM a nducie theoretical and	large experienc	
earch in the fields of submodear, molear and astropartials physics.	experimental re-	
carch in these areas requires the use of cutting-edge technology	er latnomebrari	
developed by the INFN at its own taboratories and in	insmutizai bos	
	w northeodelloo	

	The goal of extending further into the x-ray region the wavelength range for a FEL	"Know-How"
	light source can be accomplished through use of an X-band (12 GHz <sup>1</sup> ) linac	in the form of u
	structure, as compared with S- and C-band (3 and 6 GHz) linacs used elsewhere.	methods, togeth
	But, in addition, the 12-GHz CompactLight linac is to employ a section operating	reeded for scien
	at the third harmonic (36 GHz) that will be phase-synchronized with the 12 GHz	"Background"
	power. This strategy aims to linearize the longitudinal phase-space in order to	before the colla
	increase the beam brightness. About and the arms of the deal arms and the arms of the deal arms of the	"Sideground"
	Omega-P scientists that will participate in The Collaboration have previously	during the perio
	worked and are currently working at both Yale University and at Omega-P on these	activities agree
	and related topics.	same technical-
	The Parties have therefore interest in collaborating in the terms and conditions	"Foreground"
	established in this Agreement.	execution of thi
	1. The Parties shall equipmented contained an entrangelia accorded and ampolate	"Confidential
	Art. 1 Definitions	communicates t
***************************************	Inside the Agreement, whenever used in capital letters stands the following	qualified as "o
	definition for: the safety matters	moo" as griding as "cont
	"Research Activity": the scientific activity made by the Parts in consideration of	*Funding Age
	this Agreement; Haista base management with his bedraseban managelevels ban dan	support for rese
	"Intangible Asset": inventions, know-how, industrial drawings and engineering	provides barrier
	designs, secret information, computer software, database, trademarks, and every	when this propr
	other result of Research Activity that can provide economic business;	
	of The Collaboration is the exclanate answer of information and the array of all	1. The purpose
	<sup>1</sup> The frequency values stated (12 and 36 GHz, etc.) are approximate values, and not to be	personnel on iss
	taken as at all restrictive on the frequency range to be investigated within The	loss RF transm
	Collaboration. spraigson sensite the design and results on almulation shall be sense and results on a simulation of the sense of the se	soientists will en

"Know-How": closely held information, not easily available to the general public,	The goal of exte	
in the form of unpatented inventions, formulae, designs, drawings, procedures and	light source car	
methods, together with accumulated skills and experience coming from Research,	structure, as cor	
needed for scientific, technological, industrial or commercial activity;	But, in addition	
"Background": the Intangible Assets completely or partially owned by one Part	at the third harr	
before the collaboration under this Agreement;	power. This str	
"Sideground": the Intangible Assets realised or in any case obtained by each Party	increase the bea	
during the period of this Scientific Collaboration but not directly connected to the	Omegu-P scien	
activities agreed for the Scientific Collaboration itself, even if they relate to the	worked and are	
same technical-scientific field;	and related topic	
"Foreground": the Intangible Assets made or in any case achieved in the	The Parties hav	
execution of this Scientific Collaboration and because of it;	established in th	
"Confidential Information": any information or data that one Party		
communicates to the other and that at the time of the communication are expressly		
qualified as "confidential", or that, if communicated verbally are qualified in	Inside the Agr	
writing as "confidential" in the following 15 days.	definition for:	
"Funding Agency": is any public or private institution that provides financial	"Research Act	
support for research and development as described in this memorandum, and which	this Agreement	
provides barriers to dissemination or unauthorized use of proprietary materials,	"Intangible As	
when this proprietary material is so identified by the Parties.	designs, secret	
Art. 2 Objectives beyong the last valvino A decrees	other result of B	
1. The purpose of The Collaboration is to exchange research information and		
personnel on issues regarding 36-GHz RF sources, RF pulse compressors, and low-	The frequency v	
loss RF transmission waveguide. As part of this exchange, LNF and Omega-P	taken as at all	
scientists will exchange ideas and results on simulation studies and design concepts	Collaboration	

for these three categories of 36-GHz technology. These exchanges can be via	a
electronic media (e-mail, skype, etc.), via written hard-copy reports, and via	av ed noperation be ve
individual visits to one-another's facilities. A future objective, to be formalized	a. exchange of b
after CompactLight enters its R&D (or CD-zero) phase, is for LNF scientists to	b exchange of o
participate in jointly-designed experimental studies at what is expected to be a Ka	c. exchange e
band test facility to be moved in 2020 from Yale University (where it has evolved	d. any other tak
and operated during the past two decades) to a facility being sought which migh	tops wifemum
be established at Brookhaven National Laboratory in Upton, NY on Long Island	Details of the indu
Examples of existing Omega-P equipment and instrumentation that could be par	tempsob od like
of this facility are shown in the Attachment, for future reference and to illustrate	participating Fari
the nature of the Ka-band technology to be developed under The Collaboration.	the object of the
Art. 3 Scientific Coordinators	kelogen silimulas
1. The Parties shall each nominate a Scientific Coordinator whose role shall be to co	niles of this Ag -c
ordinate the activities related to the performance of the Project tasks covered by the	is
Agreement. The Scientific Coordinators shall also act as Safety Correspondents an	d la seirus est
be responsible for safety matters.	Each delegation r
The Scientific Coordinators shall:	romain that emplo
a. check every phase of the Project;	responsible for
b. support the communication between the Parties;	occupational in ur
c. keep periodic report on the Project development;	adequate health i
d. preserve the secrecy of confidential information;	delegates unless t
e. be responsible for occupational safety and health matters	appropriate instra
The Scientific Coordinators and Safety Correspondents shall be for INFN Dr	costs, shall be ou
Massimo FERRARIO and for Omega-P, Dr. Jay L. HIRSHFIELD,	.groed.
Or such successor as each Party may designate.	

Art. 4 Description of the Cooperation	for these three
Cooperation between the parties to the Collaboration can be as:	electronic and
a. exchange of personnel; and of any design as well as the standard and th	ngiv lanbivibai
b. exchange of equipment, once CompactLight enters its R&D phase;	Busquio Compaud
c. exchange of research results, data, and technical know-how; and	participate in jo
d. any other form which the parties might consider appropriate, and which are	band test iscilit
mutually acceptable and a dispose and advantage of the contract and an advantage of	ind operated di
Details of the individual activities pursued within the boundaries of this Agreement	be carabijshed a
will be documented as "Technical Annex" agreements between the respective	Examples of ax
participating Parties. At a minimum these Annexes shall contain details concerning	of this facility a
the object of the specific cooperation, time schedules, technical, financial, and	the nature of the
scientific responsibilities. If not specifically agreed-upon otherwise the general	
rules of this Agreement shall apply.	1. The Parties shall
Art. 5 Personnel and Equipment	ordinate the acti
The Parties will delegate personnel to the other Parties to the extent agreed upon.	Agreement. The
Each delegation requires the consent of the receiving Party. The delegates will	be responsible (
remain full employees of their home Institutions. The receiving Party will not be	The Scientific C
responsible for social insurance (covering pension fund, unemployment,	a. check every
occupational injury or disease). The sending Party is responsible for maintaining	b. support the
adequate health insurance and third party liability insurance coverage of the	bring result to
delegates unless the receiving Party agrees to take responsibility for providing	d. preserve du
appropriate insurance. The costs of each delegation, including salaries and travel	introdes ad a section
costs, shall be borne by the delegating Party unless it is specifically otherwise	The Scientific
agreed	Massimo PERE
guientian will epublique ideas and results on signalaria daskets and the authority of the signal of	Or such success

The receiving Party will provide assistance in finding adequate housing for the	Each Party is an
delegates. I the original Renticipation of the Committee and the committee of the committee	steingongga bne
While at the receiving Party's facility, the delegates are subject to the safety,	tifo to sest tedo
business and other rules of the receiving Party.	taxe deditional
The term "receiving Party's facility" as employed here applies only to a facility of	not, relevant for
the Parties to this agreement, and not to other facilities affiliated in any way with	liable for exacts
either party, such as Yale University or Brookhaven National Laboratory in the	ond test hadron
case of Omega-P or the other Laboratories or Divisions in the case of INFN.	Hacificoqa ei 11
Equipment sent by one Party to another Party for the purpose of this collaboration	Parties and mar
will remain the property of the sending Party unless otherwise agreed. Cost of	the Research A.
transportation will, unless agreed otherwise, be borne by the sending Party. The	The Parties at
receiving Party will act as importer and take care of all formalities, including	independently i
customs, import excise tax, etc. However, no equipment exchanges are	which may be s
contemplated in The Collaboration until after CompactLight enters its R&D phase.	In the context
Art. 6 Effective date and Duration	Lessoquia nizro
This Agreement shall become effective on the later date of signature of the Parties.	Ali data obtain
It will remain in effect until superseded or until five years from the effective date,	
whichever occurs first it can be extended by mutual consent. Any Party may	
withdraw at any time upon sixty days' notice to the other Party.	The Parties are
Once a task is initiated, it is the intention of the parties to complete the effort.	Activity: The st
Therefore, in the event of termination of this Agreement by any Party, its	from tune to tra
provisions shall continue to apply for any project begun under this Agreement until	rig neitudi daas
the completion or termination of such project.	The Partics give
Art. 7 – Intellectual Property: Backgorund and Sideground	If a palentable
The out in pared throughouse November and holy of the specific addition parties and the contract of the contra	Collaboration

	Each Party is and remains the exclusive owner of its own Background. As needed	The receiving P	
	and appropriate under the circumstances the Parties will make available to each	delegates	
	other free of charge and without being asked for in writing or in any other specific	While at the re-	
	form, their existing scientific information, research results and data, protected or	business and oth	
•	not, relevant for the purposes of the Collaboration. They will not hold each other	The term "receiv	
	liable for exactness or completeness of information which they transmit according	the Partics to thi	
	to their best knowledge.	either parts, suc	
	It is specifically indicated in the technical Annex the Background held by the	евес от Онисуан	
	Parties and made available to the other Party for the sole purpose of carrying out	Equipment sent	
	the Research Activity.	will remain the	
201	The Parties are also the exclusive owners of the Sideground, developed	w modelnockuem	
	independently in carrying out the activities covered by this Agreement, the use of	vrinii gaivinoon	
	which may be granted to the other Party through a specific written agreement.	customs, impor	
	In the context of the Collaboration, each Party shall be entitled to use for its	ni batalamataoa	
	own purposes any acquired knowledge or expertise, whether patentable or not.		
	All data obtained will be made accessible to both Parties.	memoorg A. sid T	
	effectional seperagion nowed five constants their flective dates of the night	ni mamor lijev n	
	Art. 8 Intellectual Property: Foreground	whichever occu-	
	The Parties are co-owners of the jointly generated Foreground during the Research	zne ne wzabdów	
	Activity. The shares of ownership of intellectual property rights will be established	Once o wek is	
	from time to time with a specific written agreement, taking into account the actual	Therefore, at I	
	contribution given by each Party and / or their inventors.	Britanshielvom	
	The Parties give prompt communication of the achievement of Foreground.	the completion :	
	If a patentable invention is developed by one Party in the context of the	AFL 7 -	
	Collaboration, the other Party shall be informed thereof as soon as possible in order	•	

	to decide on the appropriate ownership, before further steps are taken; it is	
-		lk od riso etchric
	understood that every Party shall be entitled to a free utilization. Joint inventions	hoth Parties in it
	shall belong jointly to the inventing parties who have to agree in each case on the	t art seascolaeth
	sharing and the joint exploitation. Pending such decision. the parties shall refrain	Na Sens van m
	from action that would prejudice patent-taking or licensing.	Funding Agency
	The inventors who achieved the invention must be recognized as authors in the	
	patent applications.	
-	The Parties are expressly forbidden to exploit the Foreground in a regime of	Lack Parts cov
	secrecy. See a molipos il a atta add the autoble pomerosal dilw sing	reerigh eith to
	Art. 9 Publications	eunmonies con
	The publications must not affect both the intellectual property of the owners and	.aonto investo la controla.
	the confidentiality obligations.	
	The results of each collaborative task should be reported to the Collaboration for	Each Party Fras
	critical review before outside announcements are made. Results to be presented for	ol solice lor
	publication in the name of the Collaboration should be submitted for publication	thrittle sitte early
	only after critical review and agreement between the members of the Collaboration	on bus becaused and ke
	task. All members of the Collaboration are entitled to be involved in the publication	the date of race
	of results obtained within the Collaboration.	The confidentia
	Art. 10- Confidentiality	S years from the
	Each Party expressly undertakes, for itself and for its employees and / or	
	collaborators, to preserve the confidentiality of sensitive information exchanged	Activities and
	during the performance of the activity covered by this Agreement and therefore not	subject to appl
	disclose any sensitive information outside the Collaboration, for the entire duration	e lo stilideliges
	of this Agreement and for a period of 5 (five) years following the natural expiry or	
	the anticipated termination, however determined, of the same. An exception to this	The Parties in t

		1
Article can be allowed when sensitive information needs to be disclosed by one or	t no decide on t	
both Parties in research proposals for support by Funding Agencies. However, such	undergrood that	
disclosures by a single party must be approved in advance by the other Party, and	shall belong joi	
in any case will be identified as proprietary in any written or oral proposals to	odr hour gnihade	
Funding Agencies. [See definition of "Funding Agency" in Article 1.]	from action that	
the neb great the revealion must be so agained as amboos in the secretary of	The inventors of	
Art. 11 Occupational safety and insurance	patent application	
Each Party covers at its own expense its own personnel involved in the execution	The Parties are	
of this Agreement, with insurance policies against the risk of accidents and	- socrecy.	
guarantees compliance with current legislation on protection and safety in the		
workplace. hus are not bridge and selected before all the design and the selected and the s	The publication	
Art.12 Withdrawal from the Agreement	laiteoliitees set	
Each Party has the right to withdraw from the Agreement at any time upon sixty	o to ature off	
days' notice to the other Party; the communication shall be through email. In this	fworestimities	
case the withdrawing Party will have to reimburse the other Party the expenses	publication in t	
incurred and keep it free from the commitments and / or obligations assumed up to	only after ordic	
the date of receipt of the withdrawal notice.	edmom If A. okeat	
The confidentiality of sensitive information must be respected by both Parties for	ando alven to	
5 years from the date of withdrawal.		
Art. 13 Funding	Each Party ex	
Activities under this Agreement, including the provision of financial support are	y Izromiedallos	
subject to applicable national laws and regulations and shall be subject to the	ellioq edo gaineb	
availability of appropriated funds.	disclose any see	
Art. 14 Liability	of this Agreeme	
The Parties in the framework of this agreement will not hold each other liable for	the authorpated t	

	damage caused by their personnel delegated to the other Party, unless such damage	omCodT	
	is caused by gross negligence or willful misconduct. Liability for damage suffered		
	by delegated personnel or third parties within the Collaboration is defined by		
,	applicable law.		
	Northmate de Fisses Physique Managlahos Problèmes de la como equipulación de	Cactor Jay	
	Art. 15 Disagreement	bas mobiler 1	
	The Parties shall, in the framework of this Agreement, do their utmost to settle		
	amicably any differences and difficulties which may arise out of this Agreement	011/8 Nave	
	should be referred to the appropriate Director for joint resolution.		
	Art. 16 Obligation		
	This Agreement is to define a collaboration, which does not constitute a contractual		
	obligation on the part of any of the Parties.		
	Art. 17 Amendments		
	This Agreement may be modified from time to time by different written agreements		
	of the parties.		
	Art. 18 Concurrence		
	The following representatives of LNF and Omega-P concur in the terms of this		
	Agreement.		
	Thus drawn up in two copies in the English language and signed by the		
	authorized representatives of the Parties.		
	days repartment in particle acontinuer Physics, 21-7 Stabiliness the decircle and		
	exteriminaries, sale his the fields of authorities, plus lear and sarroperistle physical		
	Fundational/releases in these series inquiries the areast continuentge reclaiming in		
	and instruments a developed by other INFNs are in lower hypericular and in		
	-soall decreases with industries		

The Omega-P R&D, Inc The Istituto Nazionale di Fisica Nuclea	are hasusa agamab
both factor in a constitute agreement with safety and loader and (INFN)	nikelna vd becuto at
Michield life Ly	by detograph of
tel any case will be identified as proprieters in ally writing or and proposals	TP- Lwai eldebilggs
Doctor Jay L. HIRSHFIELD Doctor Pierluigi CAMPANA	
President and Scientific Director Director	
stress of Assault Annual Strangers of Western Strangers and comment out i	The Fornes shall, in
On: 18 November 2019 On: 21 OTT. 2019	019 b yas videoims
or this representation of the contract of the	When one ad bluenc
LABORATORI NAZIONALI DI FRASCATI DELL'INFM	he see a see a see
IL DIRETTORE  Lautomana politicano a politicano a superiori del la city. Dott. Pierluigi Campana pulli alla	This Agreement is to
Art. (2 SViththerwa) Some the Assessmenting on to you to re	
Each Party has controlled months and the Agreember and the Agreemb	
days and on a no fragment significant commentation of section of the section of t	
come the withdrawing Period with Case to regol area the other than the expens	ses Leginary say to
natured and action in the community and are part of the free from the community and are for the form of the form o	(o
sentatives of the and October Propagation (New York of Services) and SM I to revision	The following repre
The confidentiality of stance to one of must be respected by both Parace.	
S years from the detact as the regard as appropriate the figure on an entered over	ni ga awaab audT
mives of the Patties . Artran Lambing	mas ligar baynodius
A cavilles under this Academiest /helidh , the year 1900 of Phannel support :	Me .
subject to upplicable national fews and regulations and shall be subject to	ne for
avaitability of an more west funds:	
Ant. Lot Labelleto.	
the turner in the framework of this speciment will not help code other lights.	Sur le la company de la compan